



Governor's Budget State of Montana

Fiscal Years 1998-1999

Marc Racicot
Governor

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Appendix to Volume 6

Renewable Resource Grant and Loan Program

January 1997

Project Evaluations & Funding Recommendations

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**Renewable Resource
Grant And Loan Program**

Appendix to Volume 6 - Governor's Budget

**Project Evaluations and Funding Recommendations
for the
1998-99 Biennium**

**Prepared by the

Montana
Department of Natural Resources
and Conservation**

January 1997

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List of Abbreviations

BMP	best management practice
BOD	biological oxygen demand
CARDD	Conservation and Resource Development Division
CD	conservation district
CDBG	Community Development Block Grant Program
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
Co.	county
CST	Coal Severance Tax
DEQ	Montana Department of Environmental Quality (formerly Department of Health and Environmental Sciences)
DFWP	Montana Department of Fish, Wildlife and Parks
DHES	Montana Department of Health and Environmental Sciences (now Department of Environmental Quality)
DNRC	Montana Department of Natural Resources and Conservation
DOC	Montana Department of Commerce
DOT	Montana Department of Transportation
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FY	Fiscal Year
GIS	Geographic Information System
GWIC	Groundwater Information Center
HUD	Housing and Urban Development
LWQD	Local Water Quality District
MBMG	Montana Bureau of Mines and Geology
MCA	<i>Montana Code Annotated</i>
MCC	Montana Climate Center
MEPA	Montana Environmental Policy Act
MSCA	Montana Salinity Control Association
MSU	Montana State University
MT	Montana
NPS	nonpoint source
NRCS	Natural Resource Conservation Service, U.S. Department of Agriculture
NRIS	Montana Natural Resource Information System
RC&D	Resource Conservation and Development Area
RD	Rural Development Program
RDGP	Reclamation and Development Grants Program
RIT	Resource Indemnity Trust
SID	Special Improvement District
SRF	State Revolving Fund
TSEP	Treasure State Endowment Program
TSS	Total Suspended Solids
USBR	Bureau of Reclamation, U.S. Department of the Interior
USDA	U.S. Department of Agriculture
USFS	Forest Service, U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WRD	Water Resources Division

Renewable Resource Grant and Loan Program

Project Recommendations Fiscal Years 1998-1999

<u>Applicant</u>	<u>Project Name</u>	<u>Recommended Grant</u>	<u>Recommended Loan</u>
1 MT Reserved Water Rights Compact Com.	Chippewa-Cree Water Rights Settlement I	\$100,000	
2 Broadwater County Conservation District	Slim Sam Riparian Area Implementation	47,080	
3 Sheridan County Conservation District	Sheridan County Groundwater Management	95,412	
4 Cascade County Conservation District	Agrimet Irrigation Water Management Project	100,000	
5 East Missoula Sewer District	Wastewater Treatment and Collection System	100,000	
6 MT Natural Resource Information System	Montana Climate Information Center	99,781	
7 Fort Benton, City of	Water Distribution Improvements		\$520,480
8 Cascade, City of	Wastewater System Improvements	100,000	
9 Greenfields Irrigation District	"J" Lake - Reregulation Reservoir	100,000	
10 Valier, City of	Wastewater Treatment Facility Upgrade	100,000	
11 Lakeside Water District	Water System Improvements		600,000
12 Beaverhead County Commissioners	Big Hole River Return Flow and Water Budget Study	100,000	
13 MT Bureau of Mines and Geology	Groundwater Protection and Education For Rural Schools	99,959	
14 Lake County Land Services	Evaluation of Level II Treatment for Individual Septic Systems	100,000	
15 Gallatin County Water Quality Prot. Dist.	Groundwater Evaluation and Monitoring Project	100,000	
16 Bloomfield School District #30	GeoSource Heat/Cool System	18,375	
17 Choteau, City of	Rehabilitation of Sewer System	100,000	
18 Yellowstone County	Conservation Resource Inventory, Billings Planning Area	29,250	
19 Glasgow Irrigation District	Vandalia Diversion Dam - Rehabilitation Study	98,221	
20 Roosevelt County Conservation District	Fort Peck Assiniboine & Sioux Off-Reservation Needs Assess.	64,561	
21 Chouteau County (Highwood)	Highwood Infrastructure Improvements	100,000	106,321
22 Pondera County Conservation District	Lake Frances Shoreline Rehabilitation Project	20,000	
23 Neihart, City of	Water Distribution System	100,000	
24 Ruby Valley Conservation District	Ruby River Water Management and Conservation Project	99,741	
25 MT Dept. of Environmental Quality	Direct Planning Grants to Small, Needy Communities	100,000	
26 Chouteau County and Fergus County	PN Bridge & Campground - Streambank Erosion Control Project	76,450	
27 Missoula, City of	Reserve Street South Sewer Project	100,000	
28 Fort Shaw Irrigation District	Irrigation Efficiency and Water Quality	100,000	
29 Custer County Conservation District	Demonstration of Livestock Waste on Irrigated Lands	97,460	100,000
30 Thompson Falls, City of No. 2	Waterline Replacement	100,000	294,000
31 Chinook, City of	Water Treatment Plant Improvements		

<u>Applicant</u>	<u>Project Name</u>	<u>Recommended Grant</u>	<u>Recommended Loan</u>
32 Park County	Hydrological Reconnaissance of the Paradise Valley	\$100,000	
33 Twin Bridges, City of	Water System Improvements	100,000	\$200,000
34 Lewis and Clark County Water Quality Prot. Dist.	Lower Tennesse Resource Assessment	100,000	
35 Hill and Liberty County Conservation Districts	Water Resource Evaluation of the Sage Creek Watershed	100,000	
36 Lewis and Clark County	Flood Mitigation Plan	39,500	
37 Glasgow, City of	Sanitary Sewer Separation Project	100,000	
38 Meagher County Conservation District	Cottonwood Creek Watershed Treatment	60,306	
39 Fort Benton, City of	Irrigation and Community Forestry Rehabilitation Project	100,000	
40 MT DNRC, Fire and Aviation Bureau	Western Montana Fire Hazard Assessment	100,000	
41 Chester, City of	Water Treatment Plant and Storage System	100,000	100,000
42 Thompson Falls, City of No.1	Water Supply Improvement Project	100,000	
43 Ekalaka, City of	Water System Improvement Project	41,000	
44 Roundup, City of	Wastewater Treatment Facility	100,000	
45 Livingston, City of	Livingston Open Space Conservation Initiative	27,000	
46 Yellowstone County	Alkali Creek Streambank Stabilization	100,000	
47 Fort Peck Rural County Water District	Fort Peck Water System Development	36,000	
48 Yellowstone Conservation District	Watershed Planning - Integrating Geospatial Information	100,000	
	Total Recommended Grants	\$3,975,096	
	Total Recommended Loans		\$1,920,801
Culbertson, City of	Wastewater Collection and Treatment Project	No Funding	
Eastern Agricultural Research Center	Alternative Irrigation Systems & Alternative Crops	No Funding	
Richland County	Lone Tree Creek Channel Rehabilitation	No Funding	

Project No. 1

Applicant Name: Montana Reserved Water Rights Compact Commission
Project Name: Chippewa Cree Reserved Water Right Settlement Project Implementation

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 50,000 Compact Authorization

Estimated Total Project Cost: \$ 150,000

Amount Recommended: \$ 100,000 Grant

Project Abstract: (Prepared and submitted by applicant.)

The Montana Reserved Water Rights Compact Commission was established to negotiate compacts with Indian tribes claiming reserved water rights within the state. The commission will present a compact among the state, the Chippewa Cree Tribe of the Rocky Boy's Reservation, and the United States to the 1997 Montana legislature for ratification. This is a major step in settlement of water rights in the Milk River basin. This basin was prioritized for issuance of a decree in the adjudication (85-2-321, MCA).

It is anticipated that related federal legislation will bring more than \$20 million to the tribe for economic and water resource development. As a result of the settlement, federal funding will also be sought for a regional water system for the reservation and surrounding communities facing water supply and quality problems.

The commission seeks funding for part of the State's cost share for settlement. The compact will give the tribe use of 10,020 acre-feet of surface and ground water on Big Sandy and Beaver Creeks. Furthermore, the compact will prevent impacts downstream to water users, including those on the Milk River, and will enhance recreation in Beaver Creek. To accomplish these goals with a limited water supply requires the following:

- Enlarged storage on the reservation. (100 percent federal funding sought.)
- Cooperative efforts for shared use of stored water by the tribe and downstream water users on Big Sandy Creek, and for maintenance of fisheries on Beaver Creek. (Federal/state cost share of administration sought.)
- Improved coordination between reservoir operation on Beaver Creek and the Milk River for more efficient use of irrigation water and enhanced recreation on Beaver Creek. (Federal/state cost share of administration sought. This grant would be used for purchase of storage water, if necessary to facilitate coordination.)
- Improved irrigation diversion structures on Big Sandy and Beaver creeks to allow efficient use of irrigation water and to facilitate enforcement. (Funded by this grant.)

Technical Assessment:

Background:

Substantial development of junior water rights, without knowledge of the extent of the existing senior tribal water right,

occurred in the Milk River basin, including the Big Sandy and Beaver Creek drainages. Implementation of the tribal reserved water rights settlements will inevitably result in increased tribal water use. In an effort to resolve the conflicts in water use, the compact commission has proposed three projects that mitigate impacts to water users downstream. Completion of these projects is integral to the ongoing efforts to reach a compact with the Chippewa Cree Tribe.

Approach:

Several project alternatives were analyzed at length. The preferred alternative on Big Sandy Creek, project 1, is to replace an individual water user's old diversion structure with a new diversion structure. The new structure will allow the diversion of water at lower stream flows. This will allow the tribe to use more water upstream while allowing the downstream irrigators to fulfill their water right. This alternative maintains existing water use and reduces the need for coordination between the state and the tribe concerning water use. In addition to being the least-cost alternative (\$75,000), this project has the support of the parties to the negotiation and the downstream water users.

On Beaver Creek, the final alternative for mitigation of impacts has not been chosen. The selection has been narrowed to two alternatives (project 2 or 3). Project 2 involves construction to replace the diversion structure for Havre Irrigation Company on Beaver Creek. This alternative costs \$75,000 and, like Project 1, will allow diversions at lower water flows, thus mitigating the impact of tribal diversions. It will also benefit other water users on the creek by allowing measurement and potential enforcement of the amount diverted. However, this alternative does not provide full mitigation for junior water users on Beaver Creek and the Milk River.

Project 3 is the purchase of contract irrigation water from Hill County stored in Lower Beaver Creek Reservoir. This water will be released during the irrigation season to water users downstream on Beaver Creek. Currently the tribe must release water from a small reservoir upstream on the East Fork of Beaver Creek. This alternative would provide full mitigation for development of the tribal water right on Beaver Creek.

Administration:

The Reserved Water Right Compact Commission will administer all phases of project implementation.

Financial Assessment:

Negotiations to settle the reserved water right of the Chippewa Cree Tribe are underway and will be finalized by the 1997 legislative session. If negotiations are not complete at that time, this application will be withdrawn. As a part of completing negotiations, the final alternative for Beaver Creek will be selected. The grant funding request for alternatives is shown below:

Total costs for the project are estimated at \$150,000. The grant request is \$100,000 with \$50,000 in matching funds as part of the compact authorization.

The grant funding request is broken down as follows: project 1 - Big Sandy Creek diversion - \$78,359, project 2 - Beaver Creek diversion - \$21,641, project 3 - Beaver Creek mitigation (irrigation water purchase) - \$21,641. Alternative 1 (Projects 1 & 2) or Alternative 2 (Projects 1 & 3) = total grant of \$100,000. Match funding comprises 33 percent of the total project cost. The \$50,000 match funds will be used to fund either Project 2 or Project 3 on Beaver Creek.

Benefit Assessment:

The quantitative results of this project will be continuation of irrigation downstream from the Rocky Boy's Reservation

despite a tribal water right that a court would most likely find to be senior to most other uses. Other important results will be long-term increased productivity in the Big Sandy and Beaver Creek drainages, measured by continuation of off-reservation irrigation and an increase of up to 2,400 acres of irrigation on the reservation. The new lower diversion structures will allow irrigators to continue to divert water during lower stream flows, thereby mitigating the effects of the increased upstream tribal water use. In addition, if the option is chosen to purchase water from Lower Beaver Creek Reservoir, the tribe will be releasing water during the winter months from their reservoir on the East Fork of Beaver Creek to benefit the trout fishery in Hill County Park. Without this purchase, the tribe would be required to release water from the East Fork of Beaver Creek during the irrigation season. Another result of this project will be an agreement to maintain water quality and stock watering on Lower Big Sandy Creek.

The project will result in the finalization of the Chippewa Cree tribal water rights settlement that will include an agreement by downstream senior water users to waive the right to object to the compact. Settlement through negotiation is the primary means through which the Department of the Interior and Congress will support funding of water development on the reservation. Federal funds for development of water on the reservation and for associated economic development will not be made available until the full scope of the state contribution is known.

Public benefits of a settlement with the tribe are not limited to the reservation. Part of the overall settlement calls for development of a municipal and domestic pipeline to transfer water from Tiber Reservoir. The pipeline will serve the reservation and many Hi-line towns and community water districts and associations. Reaching a reserved water rights compact for the Rocky Boy's Reservation is one step closer to obtaining compacts with the other two tribes in the Milk River basin and ultimately a water rights decree for the entire Milk River basin.

In accordance with the State Water Plan, this project provides multiple uses and benefits. Specifically, the project will help protect social, cultural, and economic values while improving local economic development. This project supports water conservation activities, helps to resolve a tribal reserved water right, and promotes the use of water reserved under Montana law. The project also improves agricultural water use efficiency, and improves irrigation systems.

Environmental Evaluation:

The landowner operating the diversion on Big Sandy Creek will be required to bypass a minimum of 2 cfs flows during the summer months for stockwater in the lower reaches. The increased instream flow during the critical summer season should benefit fish, wildlife, and the riparian area. Also, water will be released during wintertime into Beaver Creek from the tribe's East Fork Reservoir to benefit the trout fishery in Hill County Park.

During construction of the two diversion structures, there would be some disruption of the natural flows of the creeks. If the creeks were actually flowing at construction time, construction activity could result in temporary turbidity problems. These impacts should be small and short-lived, but could be lessened by using silt fences or constructing the structures when the flows are minimal or nonexistent.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 2

Applicant Name: Broadwater Conservation District
Project Name: Slim Sam Creek Riparian Implementation Project

Amount Requested: \$ 47,080 Grant

Other Funding Sources: \$ 2,255 Project Sponsor
\$ 9,980 USFS
\$ 450 NRCS
\$ 3,030 Crow Creek Livestock Assoc.

Estimated Total Project Cost: \$ 62,795

Amount Recommended: \$ 47,080

Project Abstract: (Prepared and submitted by applicant.)

The Broadwater Conservation District would like to submit this application for a renewable resource grant to construct 2.75 miles of riparian fence, install two cattle guards, and construct two associated water developments to serve livestock outside the fenced corridor. Completion of this project will enhance the Slim Sam riparian area while increasing livestock use on adjacent grazing areas.

The South Crow allotment management plan was recently revised by the U.S. Forest Service. Riparian utilization standards were incorporated to restore riparian systems. Currently, livestock meet riparian utilization standards in Slim Sam Creek before meeting upland utilization standards. Fencing the riparian corridor will achieve better distribution in these adjacent uplands and provide proportionately more days of grazing.

Seven permittees graze approximately 500 cow/calf pairs on the South Crow allotment. These local Crow Creek Valley ranchers make up the Crow Creek Livestock Association, which will directly benefit from grant monies. An increase of grazing days will occur annually along with a sustainable long-term use on public land. The grant would also offset labor costs of fence construction and riding that they would normally be responsible for incurring as part of their allotment costs.

Additionally, proper riparian function will increase water holding capacity, production and diversity of native herbaceous vegetation, and bank stability. Wildlife habitat and aesthetic value will also improve. Erosion and sedimentation will decrease. There are 200 or more downstream users in Crow Creek Valley and the upper Missouri River Valley, including agricultural producers and recreationists, who will also benefit.

The requested grant would cover costs for fence materials, water development material, purchase of cattle guard, and construction labor. Broadwater Conservation District sponsors this project in partnership with the NRCS, U.S. Forest Service, and Crow Creek Livestock Association.

Technical Assessment:

Background:

This project developed out of recommendations derived from the Crow Creek environmental assessment completed by

the U.S. Forest Service as part of the Helena National Forest Plan and the Elkhorn Landscape Analysis. The project sponsor seeks to implement a grazing management strategy in the Crow Creek allotment through a combination of fencing, off-stream water development, and improved livestock distribution. Range analysis conducted by the U.S. Forest Service revealed that riparian fencing, in addition to active management, was necessary to optimize grazing potential in the region. Cattle tend to gravitate to the riparian corridor. Forage utilization standards are met in this area long before the surrounding uplands have achieved the standard. Riparian fencing will thus enable the permittees to use upland forage without damaging resources in the riparian corridor. Since Slim Sam Creek is a main source of livestock water, water will need to be piped outside the fenced project area to each adjacent grazing area.

Approach:

The Crow Creek environmental assessment looked at six alternatives for livestock management in the allotment, including a no-action alternative. This project would implement elements of the preferred alternative of this study. This alternative includes a combination of vegetative treatment, and livestock management through grazing and fencing. The Helena National Forest did not consider a no-grazing alternative.

The proposed project seeks to increase flexibility for the livestock operator by focusing on specific forage utilization standards in identified areas. The project includes fencing portions of Slim Sam Creek, off-stream water development, and installation of two cattle guards on a route that provides user access to the area. The water developments will consist of 200-psi black pipe, 36-inch culvert head box, 750-gallon fiberglass stock water tanks, and miscellaneous plumbing.

Expert technical review by forest and range management professionals suggests that the grazing management component of the proposal is integral to overall project success. A well-developed grazing management plan, endorsed by the Crow Creek Livestock Association, must be in place before project implementation.

Administration:

Grant contract administration will be provided by the Broadwater County Conservation District and the U.S. Forest Service. Grant expenditures will cover the costs of materials and labor for the fence, water developments, and the purchase of one cattle guard. The Forest Service will provide one cattle guard and the labor for installation of both cattle guards. All engineering, surveying, and design will be performed by Forest Service, Crow Creek Livestock Association, and NRCS personnel.

Financial Assessment:

Total cost for the project is estimated at \$62,795. Grant amount requested is \$47,080, with \$15,715 in matching funds committed to the project.

Match funding comprises 25 percent of the total project cost. The project sponsor has committed \$2,255 to project administration and construction. The U.S. Forest Service has committed \$9,980 to project administration, technical support, materials and labor. NRCS will provide \$450 in technical support to the project. The Crow Creek Livestock Association, the direct beneficiary of the project, has pledged \$3,030 to cover technical costs and payment of a range rider to implement the grazing management activities associated with the project.

Of the \$47,080 requested for grant funding, expenditures are broken out in the following categories: \$17,750 in labor cost for fencing and off-stream water development, \$23,250 in materials costs, \$1,800 to help cover the costs to hire a range rider assist with livestock distribution, and \$4,280 as a contingency expense to cover the costs of unforeseen circumstances throughout project implementation.

The budget is adequate to cover project costs and is financially feasible as proposed. Useful life of improvements paid for with grant expenditures is estimated at 10 to 25 years.

Benefit Assessment:

Completion of the project will result in the long-term protection of a watershed that provides benefits to a wide range of forest users. Water quality, wildlife, fish, and recreation resources will improve while promoting appropriate livestock management strategies on the allotment. The project will improve the water-holding capacity in the watershed that will benefit downstream users by extending flows longer into the summer. There is also a benefit to water quality through improved riparian function. Crow Creek is currently listed as a "Water Quality Limited Stream" by DEQ because of non-point source pollution. This project will help reduce the non-point source impacts on Crow Creek. The project will additionally support an elk viewing and interpretive site that would be impossible without fencing. The project significantly conserves, manages, and develops renewable resources.

Grazing impacts on watersheds has been identified as an issue of statewide concern and remains the subject of great controversy. This project has the support of a broad coalition including stock growers, wildlife agencies, environmental groups, legislators, and a variety of state and federal agencies.

In accordance with the State Water Plan, this project is a watershed-related, range management project. The project would manage plant ground cover, thereby reducing drought impacts and increasing stream water-holding capacity. This project would improve water-use efficiencies in an agricultural "system" without adversely affecting groundwater or return flows. This is a voluntary approach to reducing the source of non-point source pollution and provides state funds to match federal funds to address this problem.

Environmental Evaluation:

There are no significant adverse environmental impacts as a result of this project. There will be minimal disturbance associated with the installation of stream head boxes and fence construction. The project sponsor will need to secure a 124 Stream Preservation Permit for the construction of head boxes from DFWP. The Crow Creek environmental assessment determined that no endangered or threatened species will be affected by the project, and the U.S. Forest Service will conduct a cultural and historical inventory prior to project development.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$47,080. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 3

Applicant Name: Sheridan County Conservation District
Project Name: Sheridan County Groundwater Management Program

Amount Requested: \$ 95,412 Grant

Other Funding Sources: \$ 15,852 Other DNRC grant funds
\$ 56,464 MBMG

Estimated Total Project Cost: \$ 167,728

Amount Recommended: \$ 95,412

Project Abstract: Prepared and submitted by applicant

The purpose of this project is to manage groundwater pumping from a large aquifer system in the eastern portion of Sheridan County. This will be accomplished by: (1) carefully reviewing applications to use groundwater; (2) monitoring aquifer conditions; and (3) estimating how much water can be safely pumped from the aquifers without substantially affecting other water uses.

In December 1994, the Board of Natural Resources and Conservation reserved 15,479 acre-feet of water per year from the aquifers for the Sheridan County Conservation District. The district intends to use the water for irrigation. However, when the district's application for water was before the board, there were concerns that the proposed groundwater pumping could affect wetlands, especially those on the Medicine Lake National Wildlife Refuge. The board, therefore, stipulated that the conservation district can issue authorizations for the use of 5,809 acre-feet of the water. Once this level is reached, DNRC will hold an administrative hearing to reassess the situation and determine whether the district should develop the remaining 9,670 acre-feet of water.

Since the conservation district received its water reservation, local farmers have expressed much interest in developing the water. In fact, the district has already received permit applications that, in total, approach the 5,809 acre-foot intermediate cap.

The district is working in partnership with state and federal agencies to manage groundwater development, monitor water levels, and model the aquifer. It is the district's hope that, with the information gathered during this process, the partners can come to a joint conclusion regarding how much water beyond the 5,809 acre-foot intermediate cap should be developed for irrigation. The funds requested by the district in this grant application will be used to work toward this end.

Technical Assessment:

Background:

An extensive aquifer system associated with buried glacial outwash channels and the buried ancestral Missouri River channel underlies the eastern portion of Sheridan County. In 1989, the Sheridan County Conservation District (SCCD) applied to the Board of Natural Resources and Conservation (Board) for a water reservation to reserve much of the available water in the aquifer for irrigation and to manage the groundwater to best benefit all users. In 1994, the Board

reserved 15,479 acre-feet of water for SCCD, but with conditions. The Board stipulated that SCCD could begin to permit water use up to 5,809 acre-feet of water. This value is based on evidence presented to the Board that the amount of water in the aquifer available for withdrawal ranges from 5,800 to 15,500 acre-feet per year. Once the 5,809 acre-feet intermediate cap is reached, DNRC will hold a hearing to decide if the remaining portion of the reservation can be permitted. At that hearing, SCCD will need to present detailed information concerning groundwater availability from the reservation.

Approach:

A detailed groundwater management assessment is required to determine the amount available for withdrawal on a sustained yield basis. SCCD is applying for this grant to help support this assessment and to satisfy the conditions placed on the water reservation. SCCD proposes to address the groundwater management program by (1) assessing the applications received for use of the reserved water; (2) monitoring aquifer conditions including water levels, water use, and water quality; and (3) determining the amount of water in the aquifer that can be safely withdrawn.

The district maintains an ongoing well monitoring program that will be continued through this study. Water level data will be used with climate, surface flow, and pumping data to monitor aquifer trends. Water samples will also be collected and analyzed to examine the suitability of water for irrigation and to monitor aquifer water quality trends.

Based on expert review, this phase of the study fails to adequately evaluate the effects of groundwater withdrawals on surface water quantity and quality. The Board's order establishing the water reservation directs the district to evaluate the potential adverse impacts of development on water users and other resources. In keeping with that directive, this study needs to more thoroughly evaluate the impacts of groundwater withdrawals on surface water quality and quantity.

Under a separate project, a graduate student will model the hydrogeology of the aquifer. Monies from this grant will be used to update and refine the model as additional data are compiled. Quantitative results from the model will be used to estimate how much water is available in the aquifer.

Administration:

SCCD will administer the water reservation. The district's office manager will administer this grant. The proposal will be coordinated through a technical committee with a team composed of DNRC, Montana Bureau of Mines and Geology (MBMG), U.S. Fish and Wildlife Service (USFWS), and NRCS personnel. Committee members will evaluate each application for the potential effects to senior water right holders, the quality of water and its suitability for irrigation, and the potential for adverse effects to wetlands. The district will maintain authority over the approval of applications and the technical committee will act as an advisor.

Financial Assessment:

The proposed project's total cost is \$256,816. The SCCD \$95,412 grant request includes \$8,500 for contract administration, \$75,912 for professional/technical costs, and \$11,000 for construction that includes monitoring well drilling.

SCCD will use previously awarded DNRC grant funds to help finance the project. These funds amount to \$15,852 for professional/technical costs. MBMG will contribute \$56,464 toward professional/technical costs.

The project, as proposed, is financially feasible.

Benefit Assessment:

The proposed project would directly promote the protection and management of a natural groundwater resource in Sheridan County. Assessment of the groundwater quantity is the preferred method for addressing questions concerning the availability of water in the aquifer and to meet the conditions the Board attached to the water reservation.

The proposed project would provide the hydrogeologic data necessary to evaluate the amount of groundwater that can be safely withdrawn from the total amount reserved in the aquifer. The proposed project will significantly contribute to resource conservation, management, and protection by providing the necessary information to the Board so that informed decisions concerning the availability of groundwater can be made. The project will also benefit the people of Montana by developing groundwater resources in an economically and environmentally sound approach.

Public support from federal, state, and public entities and private citizens is documented. The project will provide measurable benefits to the community and will continue beyond the life of this grant.

Environmental Evaluation:

It was determined that no adverse environmental impacts would result from activities associated with this proposed project. This determination was made based on the fact that the project consists of a hydrogeological study and does not include activities that would result in any impact to the environment. No environmental assessment was completed for this project.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$95,412. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Prior to contracting, the project sponsor must present a plan to more thoroughly evaluate the impacts of groundwater withdrawals on surface water quality and quantity and the potential adverse effects of these activities on water users and other resources.

Project No. 4

Applicant Name: Cascade County Conservation District
Project Name: AgriMet Irrigation Water Management Project

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 6,000	USBR
	\$ 50,300	Bonneville Power Administration
	\$ 4,000	Irrigators
Estimated Total Project Cost:	\$ 160,300	
Amount Recommended:	\$ 100,000	

Project Abstract: (Prepared and submitted by applicant.)

AgriMet is a real time agricultural/meteorological information system that collects weather data. AgriMet weather stations monitor temperature, relative humidity, solar radiation, wind speed, and precipitation. These data are measured every 15 minutes and stored, then relayed via satellite every four hours to USBR computers in Boise, Idaho, and Billings, Montana. USBR maintains the AgriMet weather stations and correlates the crop water use data used in forecasting evaporation rates for more than 40 crops. This information can be accessed with a personal computer and is also available on the Internet.

Montana's AgriMet outreach program provides in-field data collection and training to irrigators, energy and system audits, intensive soil analysis, crop water staging, nutrient management, and weekly irrigation schedules. Started as a demonstration project in 1993 at Toston, in Broadwater County, the Montana AgriMet program is trying to expand its benefits and technology to reach more irrigators and to other areas in the state. AgriMet benefits include reduced energy use; improved crop yields; water savings for improved fisheries; reduced leaching of fertilizers and pesticides into groundwater; reduced fertilizer applications; and improved economic conditions in agricultural communities and the state.

The Bonneville Power Administration (BPA) funded the development of AgriMet in 1983 in the Pacific Northwest. Bonneville believes that the Toston example is the best way to implement an AgriMet program that assures use of the information and provides quantitative results. BPA is assisting the Montana AgriMet Coalition of Conservation Districts to expand AgriMet regionally. The AgriMet Coalition is developing an extensive public/private partnership to address irrigated agriculture's needs while providing environmental benefits for Montana's citizens.

Agriculture is the main user of AgriMet, but other uses can be applied with the data. Other uses include urban water conservation, drought forecasting, year-round weather data acquisition, stream flow yield forecasts and solar energy research.

Technical Assessment:

Background:

This project is a continuation of an AgriMet project sponsored by the Broadwater Conservation District and funded through DNRC's Renewable Resource Development Program in 1991. It was shown that, given a reliable source of data, irrigators are willing to adjust their irrigation habits to more accurately reflect crop needs. These changes in irrigation schedules can result in significant water savings.

This project is part of a larger effort to maintain and expand the use of the AgriMet program in Montana to provide for irrigation water use efficiency, reduced irrigation energy use, surface and groundwater quantity and quality improvement, and economic benefits. This project proposes to continue implementation of the AgriMet program in the existing AgriMet irrigation water management project area. This area extends from the Fairfield Bench northwest of Great Falls to the Dillon area and from the Deer Lodge Valley to Toston. Nearly one million acres of irrigated land is included in this project area, of which 350,000 acres are sprinkler irrigated.

Approach:

The AgriMet program currently focuses on sprinkler irrigated land because of the power savings incentive in reducing the amount of sprinkler irrigations necessary to raise a crop. Tests are conducted involving an irrigation energy use and system audit, a soil investigation, and placement of soil moisture probe access tubes. Information produced through analysis of test results helps irrigators improve overall water management through more accurate irrigation scheduling. This quantitative information is put to work through the coordination of AgriMet training for sprinkler irrigators within the area.

Public outreach is an integral component of the AgriMet program. All irrigators within the project area will be contacted to explain the benefits of using the information provided through AgriMet. Additionally, all stakeholders and beneficiaries, ranging from conservation groups to federal agencies, will be contacted to build a permanent partnership between public, private, local, state, and federal sources to fund, direct, and administer the AgriMet program. Educational tours and workshops are one method that will be used to establish these partnerships.

The project proposes to expand the existing AgriMet program to include an additional 10,000 acres of irrigated land. The goal is to attain a water savings of approximately 12,000 acre-feet. The AgriMet project manager will monitor water savings and quantify the results in yearly program reports. A plan to measure and document the water savings, energy savings, crop yields, and effects on water quality, after implementation of the program, will be included in the scope of work.

Administration:

The Montana AgriMet Coalition of Conservation Districts (AgriMet Coalition) will administer the overall project effort in coordination with USBR, NRCS, BP, Montana State Extension Service, and others as necessary.

Project staff will include two field technicians and one program manager. The technicians will monitor soil moisture; develop irrigation schedules; inform irrigators of possible insect or disease problems; audit pumping plant efficiency; analyze irrigation system efficiency; and help the program manager provide reports to the irrigators and DNRC. The program manager will coordinate all aspects of the implementation of the program including supervising personnel, coordinating irrigator and agency participation, reporting, and promotion and outreach of the program.

Financial Assessment:

The proposed project's total cost is \$160,300. Cascade County Conservation District's \$100,000 grant request includes \$41,220 for administration costs (includes half of program manager's salary) and \$58,780 for professional/technical costs. BPA will contribute \$41,800 for administration cost (includes half of program manager's salary) and \$8,500 for professional/technical costs. USBR will contribute \$6,000 for professional/technical costs. The irrigators will contribute \$4,000 for administration costs.

This grant will fund an ongoing program. The department and the legislature have discouraged ongoing grant funding to support state programs. The applicant is encouraged to seek a more reliable source of revenue for this purpose.

Benefit Assessment:

There are nearly 1,000,000 irrigated acres in the project area, of which 350,000 acres are sprinkler irrigated. The phase of the AgriMet program will directly affect more than 50 irrigated farms covering roughly 10,000 irrigated acres. The goal of the project is to attain water savings of 30 percent that would result in a net savings of approximately 12,000 acre-feet of water a year in the project area. The water and energy savings resulting from this project will continue to increase as irrigators adjust irrigation habits to include additional irrigated lands.

This project will enable irrigators to conserve water and energy. Project implementation will result in the improved conservation and management of water resources statewide once the program is fully established. The preservation of groundwater and surface water quality should occur as a result of reduced fertilizer and farm chemical leaching from irrigated lands.

The proposed project would directly implement the State Water Plan sections regarding agricultural water use efficiency

through improvement of irrigation efficiency; drought mitigation through data collection and forecasting; establishment of incentives for private investment in water conservation; encouraging voluntary water conservation; and improvement of water use and conveyance efficiency in agricultural systems without adverse effects to water rights.

Support is shown from local entities and a broad range of state and federal groups and agencies.

Environmental Evaluation:

The proposed project involves the implementation of an agricultural/meteorological information program on irrigated land in the proposed project area in Montana. No adverse environmental impacts should occur as the result of field activities to implement the program.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 5

Applicant Name: East Missoula Sewer District
Project Name: Wastewater Treatment and Collection System

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 500,000	TSEP Grant
	\$ 400,000	CDBG Grant
	\$1,000,000	RD Grant
	\$1,000,000	RD Loan
	\$1,500,000	SRF Loan
	\$ 100,000	Water Quality District

Estimated Total Project Cost: \$4,600,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The project includes the construction of wastewater collection and treatment facilities to serve the estimated 1,750 residents of the East Missoula Sewer District. Collection will be provided by a conventional gravity collection system using two lift stations at low collection points. Treatment will be provided with aerated lagoons, storage, spray irrigation, and limited use of infiltration basins. Currently, wastewater treatment is provided by on-site systems, primarily cesspools and drainage pits. Most of the individual residential wastewater systems employ outdated technology that provide minimal

treatment prior to discharge to local groundwater. Problems with the existing system relate to high residential and commercial density, marginal existing wastewater treatment, threats to drinking water wells, and potential contamination of the Clark Fork River, a water quality limited stream.

The proposed project will eliminate all problems associated with the existing individual systems and will protect water quality in the Hellgate Valley aquifer and the Missoula Valley aquifer. These two aquifers, which are hydraulically connected, provide drinking water for the Missoula Valley residents and serve to recharge the Clark Fork River. The proposed East Missoula Sewer District treatment system includes processes to dispose of treated wastewater in a beneficial manner on agricultural crops. The system will re-use nutrients in the wastewater that otherwise could result in pollution of surface waters. Irrigating with wastewater will also replace and conserve other sources of irrigation water.

Technical Assessment:

Background:

The East Missoula Sewer District was formed in 1992, primarily to address the need for improved wastewater handling facilities in the East Missoula area. Wastewater treatment facilities in East Missoula and the surrounding area currently consist of individual septic tank/drain field systems. A critical need exists in this rapidly growing area for a centralized wastewater collection and treatment system. When completed, the proposed project will protect water quality in the Hellgate and Missoula Valley aquifers. These two aquifers, which are hydraulically connected, provide drinking water for Missoula Valley residents and serve to recharge the Clark Fork River.

The goal of the project is to eliminate individual septic systems and protect the local aquifers from contamination. The East Missoula community currently pumps its drinking water from a system of wells, one of which is currently under a boil order due to bacterial contamination that is probably the result of influence from local drain fields or cesspools.

A facility plan was completed for the East Missoula Sewer District in 1996. In that plan, options and alternatives are presented to identify and correct the wastewater handling problems that exist and thereby facilitate future development. Common to all alternatives is the goal of protecting the two aquifers supplying the Missoula area with water. In addition to several wastewater collection and treatment alternatives, the facility plan also addresses the option of connecting to the City of Missoula's wastewater system, an option that would require annexation with the City of Missoula. In addition to the required construction of an interceptor between East Missoula and Missoula, other economic factors do not favor this option over the construction of a separate system for the East Missoula community.

Approach:

The approach being used by the East Missoula Sewer District is sound. Having formed in 1992, the district is eligible for many financing options available through state and federal government. The hiring of an engineer to study the problem and present findings and recommendations in a facility plan is the proper approach technically and financially, as most grant and loan programs require this document as part of the funding application package.

Included in the facility plan are letters documenting public support for the project along with basic technical documentation. Enough technical data have been collected to support land use area requirements and their availability, along with a technical discussion that compares alternatives and selects the most effective one. Based on performance and a 20-year present worth analysis, the best alternative is a gravity flow collection system with lift stations, an aerated lagoon system, infiltration basins with a storage lagoon, and land application of the treated effluent. The purpose of the infiltration basins is to reduce storage requirements by effectively disposing of effluent through infiltration for about one month prior to and following the irrigation season.

Administration:

A facility plan has been written and submitted to DEQ for review; this process is required for the procurement of an SRF loan. In addition to this application, a TSEP grant application is also pending. The community has applied to the USDA Rural Development Program for grant and loan funding. The balance of the project would come from an SRF loan. Applications to other funding agencies will be made during the next year. Construction is scheduled for the 1998 and 1999 construction seasons.

Financial Assessment:

The East Missoula Sewer District is newly formed, and currently operates no facility or collects revenue. Dependent upon the extent of grant funding for this project, rates will vary from \$17.10 per month to \$45.11 per month for a residential hook up. The district is in the process of properly organizing a project and workable spending plan. The community plans to borrow \$2,500,000 of the required \$4,600,000.

The cost estimates for the project are in line with historic costs for recent similar projects. Design and inspection costs and a construction contingency are included. The spending plan is consistent with funding availability, assuming the applications to the various agencies are successful. The budget is adequately justified in the application, and the project is financially feasible and well supported.

Benefit Assessment:

The project will provide positive long-term impacts including the protection of surface and groundwater quality and increased economic development potential.

This project will implement the State Water Plan by proactively protecting the Missoula Valley and Hellgate aquifers. Additionally, water quality in the Clark's Fork River will be protected and improved. The project has documented citizen support, and will facilitate the orderly development of the East Missoula and lower Hellgate Canyon areas.

Environmental Evaluation:

No long-term adverse environmental impacts would occur as a result of this project. Temporary adverse environmental impacts such as noise and dust may result and would require mitigation during construction.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project. The project shall be designed, reviewed, and constructed in strict accordance with DEQ requirements.

Project No. 6

Applicant Name: Montana Natural Resource Information System (NRIS)

Project Name: Montana Climate Information Center

Amount Requested: \$ 99,781 Grant

Other Funding Sources: \$ 48,479 Project Sponsor

Estimated Total Project Cost: \$ 148,260

Amount Recommended: \$ 99,781

Project Abstract: (Prepared and submitted by applicant.)

On October 1, 1995, the Montana Climate Center (MCC) on Montana State University (MSU) campus closed. MCC carried out important functions on behalf of the state including: (1) responding to information requests; (2) formatting and archiving data; (3) collecting daily weather data; (4) summarizing climate information for use in land and water management projects; and (5) conducting climate research. MCC provided critical support for the State's drought monitoring effort by calculating the Palmer Drought Severity Index. Efforts to revitalize MCC were initiated by NRIS and others, but no funding was available to revive the program. Closure of MCC is a serious set-back for many programs that depend on climate information, and for new efforts to expand the use of climate information to help citizens and government respond to, and in some cases take advantage of, Montana's diverse climate and variable weather conditions. The goal of this project is to establish a Climate Information Center as part of the NRIS program to supply and expand on services provided by the former MCC. NRIS would not conduct research. NRIS is requesting startup funding to help defray the expense of establishing the climate information center. During the startup period, NRIS would identify and secure funding to maintain the center. NRIS would work with the Western Regional Climate Center in Reno, Nevada, and others, to maintain data summaries and tools to support applications used in agriculture, recreation, water- and land-use management, engineering projects, mining, and, significantly, in almost every environmental impact assessment undertaken. New geographic information system (GIS) maps and graphs would be developed to make the climate information easier to understand. All data products would be available through NRIS, including access via the Internet.

Technical Assessment:

Background:

The project will replace capabilities lost when the Montana Climate Center closed in 1995. The Montana Climate Center (MCC) provided climate information services for climate data users in the state. Attempts to revive MCC have failed. This application represents an alternative effort to secure a means to continue to provide climate data in Montana.

MCC carried out important functions which included: responding to information requests for climate data and information from Montana citizens; formatting and archiving data for all weather stations in Montana; collecting daily weather data from the MSU weather station; summarizing climate information for land-use and water management projects; and conducting climate research. Furthermore, MCC provided critical support for the state's drought monitoring effort, a project funded as a top priority under this program in 1993 in response to State Water Plan priorities. MCC calculated the Palmer Drought Severity Index mapped by the project sponsor and used to help in reporting the state's water supply to the Governor's Drought Advisory Committee.

Plans to provide other types of climate and weather data summaries to the public and decision makers were on the table when MCC was closed. The closure of the MCC is a serious set back to the applicant's effort to expand the use of climate information to help Montanans respond to and take advantage of Montana's diverse climate and variable weather conditions.

Approach:

This project aims to re-establish a means to secure data needed to continue serving Montana's climate data needs. Several alternative proposals have been advanced to address the need for a climate information center in Montana. The alternative selected would put the responsibility for maintenance of this data within a neutral agency that currently maintains natural resource information and data. The project sponsor's existing capabilities will ensure that data are maintained efficiently and at a reasonable cost. The project sponsor is experienced in obtaining grants to support natural resource data and will be proficient in obtaining funds to continue the project after the start-up phase.

Under the selected alternative, the project sponsor will establish a climate information center to provide and expand on some of the services and activities provided by the former MCC. The project also will improve access to existing sources of climate data and create more effective maps and graphics to make the information easy to understand. The final product will be an information system through which users can access easy-to-use climate information.

That MCC was already gathering and providing weather data indicates that the project is highly feasible. Methods of gathering data will be improved because the project sponsor houses state-of-the-art computer technology and experienced staff. The project sponsor will continue to work with those that historically provided data to MCC. These agreements will facilitate the development of a data base the project sponsor needs to produce the various reports and maps for the many users of climate data.

Administration:

The project sponsor will use existing computer hardware and software to process and package data. Costs for the project will be less than if such capability had to be established elsewhere. The project sponsor has experience in managing similar projects.

Financial Assessment:

The total cost of the project for two years is \$148,258. The project sponsor would provide matching costs of \$48,477. The remaining \$99,781 is funded through Renewable Resource grant dollars. \$10,009 is allocated to project administration and \$89,772 is allocated to professional/technical costs. Over a two-year period, these monies will be used to cover personnel costs to run the project. \$3,000 per year is allocated to fund outside consultants.

The project sponsor presents a complete, well-documented, justified, and credible budget. The project will benefit from existing computer hardware and software; associated computer costs are for the maintenance of the system that exists and these costs are consistent with costs allocated to all similar programs managed by the project sponsor. No adjustments in the budget will be necessary.

Benefit Assessment:

The project contributes to the management of agriculture, recreation, land, and water resources in Montana. The agricultural sector uses climate data to make cropping decisions. These data are also used in the preparation of environmental impact statements. The recreation industry can use information to assess the current recreation conditions

in areas across the state. Each of these uses has strong economic implications for Montana.

Climate data have been consistently used by Montanans across the state. Such data have been particularly useful in the assessment of Montana's drought situation.

This project indirectly supports the policy objectives of the State Water Plan through by providing water resource information to the public. The project would also provide technical assistance to the Drought Advisory Committee to promote awareness and preparedness. Sustaining a climate center builds the body of climate information needed to improve drought response and understanding of Montana's related climate issues.

Environmental Evaluation:

The project will result in no significant adverse environmental impacts.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$99,781. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 7

Applicant Name:	City of Fort Benton	Loan Only
Project Name:	Fort Benton Water Distribution Improvements	
Amount Requested:	\$ 520,480	Loan
Other Funding Sources:	\$ 480,244	TSEP Grant
	\$ 19,943	City of Fort Benton
Estimated Total Project Cost:	\$1,020,667	
Amount Recommended:	\$ 520,480	Loan

Project Abstract: (Prepared and submitted by applicant.)

The City of Fort Benton completed a master plan for its water system in 1990. The plan identified several distribution lines and related facilities that needed replacement. According to Peccia & Associates, the city's engineer, the recommended improvements would increase the efficiency of the storage system, decrease pump head loss, and increase pump output. The improvements would also improve the fire flow protection to the areas in downtown, and the elementary school and hospital. The city completed a portion of the most critical improvements in 1992, and the proposed project consists of the other improvements included in phase I of the plan. In 1995, the engineer updated the plan and revised the cost estimates.

While planning the proposed project, the city decided to address the question of installing water meters throughout the community. Fort Benton currently has 80 residential users on meters. The remaining 546 residential users are on a flat rate based on the type of plumbing fixtures within the home. Installing meters will be complicated by that fact that many homes have at least one boulevard tap, and others have multiple service lines. The need to install meters, however, is made clear by the high level of water usage. Since 1988, the city has pumped a daily average of 547,647 gallons. With 727 total users, this relates to 700 gal/day/user or 20,776 gal/month. To develop a prudent approach to this problem, Fort Benton hired Neil Consultants earlier this year to prepare a preliminary engineering plan for the meter installation portion of the proposed project.

These figures convinced the city to proceed with meter installation. Due to the complexity of this work, however, the city will install meters over a two-year period. This approach will give the city an opportunity to educate the community and evaluate each individual property for the scope of work. Once residents are aware of the amount of their water consumption and are educated on water conservation, average water consumption will be reduced. The decrease in consumption should also decrease the operational cost of the water plant through reduction in chemicals, energy savings, and pump replacement.

Technical Assessment:

Background:

In May 1990, the City of Fort Benton hired Robert Peccia & Associates, Inc. to complete the "Water System Master Plan and Distribution System Improvements" report for the community. It was later updated in 1995. The master plan described the existing water system, identified deficiencies within the system, and prioritized necessary water system improvements. Earlier this year, the City of Fort Benton hired Neil Consultants of Great Falls to conduct a metering study of the water system.

This project addresses the following water system problems that were identified by the city's consultants: (1) inadequate fire flows due to deteriorated lines or broken valves, (2) inadequate fire flows due to undersized distribution lines, (3) low overall efficiency due to system layout and deteriorated lines, and (4) high water usage. Tim Farwick, Public Works Director for the City of Fort Benton, helped direct the 1995 master plan revision so that the worst sections of water main will be replaced first. He also strongly supports metering of the water system to promote water conservation.

Approach:

The City of Fort Benton is planning to complete the highest priority items identified in the master plan. The construction items proposed to be completed under this project are: (1) more metered homes within the community; (2) the replacement of 2,340 feet of water main on 18th Street to the water tank; (3) the replacement of 1,100 feet of water main on 12th Street; (4) the replacement of 3,500 feet of water main on Main Street and 13th, 16th, and 18th streets; and (5) a 1,050-foot water main loop along 16th Street.

Administration:

Final plans and specifications would be prepared by a consultant and reviewed by DEQ before actual construction would begin. A possible 60-day review by the DEQ would extend the project's dateline to August 1998. Tim Farwick, the Fort Benton Public Works Director, could be entrusted to direct spending of the \$240,000 lump sum requested for water system metering.

Financial Assessment:

The City of Fort Benton is requesting a loan in the amount of \$520,480 from DNRC to help finance its proposed \$1,020,667 project. No DNRC grant funds were sought and the city has indicated the ability to handle the additional debt. In addition to the requested DNRC loan, a grant application for \$480,244 has been submitted to the TSEP and the City of Fort Benton will contribute \$19,943 towards the proposed project. The city's share will be used towards preliminary engineering costs and loan origination and bond counsel fees.

Both DNRC and TSEP funds are required to cover the full scope of the project. If TSEP funds are not awarded to the city, the scope of the distribution system improvements could be easily limited to a budget covered by only DNRC and city funds.

Benefit Assessment:

The proposed metering program would help promote the conservation of the City of Fort Benton's treated public water. Of the requested project funds, \$240,000 is designated for water system metering. It is anticipated that water usage will be reduced, and therefore water conserved, as a direct result of metering the Fort Benton community, which currently has a very high per capita water use figure of 700 gallons per day. The city's metering program is proposed to extend over a two-year period, during which time the public will also be educated on water usage. There are unmetered boulevard water taps available for homeowner irrigation that are suspected to be a major source of water usage. After metering, the city expects to see a significant decrease in the use of these taps.

As evidenced by computer modeling in its water system master plan, the City of Fort Benton will receive significant improvement to its fire flow capabilities in the downtown commercial district and hospital areas once the water distribution system improvements are completed. The new water main to storage tank 2 will help provide additional water to the elementary school and courthouse, which also have some problems meeting Insurance Services Office fire flow requirements. Other benefits to be realized by the proposed water system improvements are increased efficiency of the storage system, and decreased pump head loss and increased pump output.

This project implements the State Water Plan through water conservation improved efficiency. Meter installation will potentially conserve significant amounts of water. The project will improve efficiency of municipal, agriculture, and industrial users.

Environmental Evaluation:

No permanent adverse impacts are anticipated from the proposed project, which consists of the rehabilitation of existing sections of the water distribution system and the installation of meters on existing service lines. Construction will occur on already disturbed areas, and noise and dust problems will be limited to the construction phase of the project.

An environmental impact study is not required for the proposed project since it is not expected to have any significant negative impacts on the quality of the physical or human environments. As part of their plans and specifications review of the proposed water system improvements, DEQ would complete an environmental assessment.

Recommendation:

DNRC recommends approval for loan funding of the total amount requested, \$520,480. Loan funds for the project will be provided after DNRC approves a scope of work, administration and a budget, and after all matching funds have been

secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project. Plans and specifications for the proposed project must be reviewed and approved by the DEQ prior to project construction.

Project No. 8

Applicant Name: City of Cascade
Project Name: Wastewater System Improvements

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 400,000	CDBG Grant
	\$ 500,000	TSEP Grant
	\$1,330,000	SRF Loan
	\$ 6,500	Local Funding

Estimated Total Project Cost: \$2,336,500

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The proposed project consists of improvements to the town's wastewater collection and treatment systems. These improvements are necessary to address deficiencies present in the system that may lead to public safety and health problems.

The town is currently under a mandate from EPA to correct deficiencies with the existing wastewater treatment facility. The facility consists of two lagoons, located on an island in the Missouri River northeast of town, which leak so badly that they currently do not hold water. As a result, little treatment is achieved prior to the effluent migrating into the groundwater and ultimately the river. The town proposes to relocate the facility to a site northwest of town. The new facility will consist of facultative lagoons and spray irrigation for disposal.

A portion of the town's storm sewer system drains directly into the sanitary sewer collection system. During storm events, the collection system does not have the capacity to handle the peak flows resulting from storm run-off. The system is designed to overflow sewage and storm water directly into the river prior to reaching the lagoons. Separating the two systems will enable the new treatment facility to be smaller sized, reduce long-term operation and maintenance costs, and eliminate pollution of the river with untreated sewage. New storm drain lines and inlets will be installed in the western portion of town to replace inlets that drain directly into the sanitary sewer.

An antiquated lift station will be replaced on Russell Street. This is a preventative measure. The town feels that it should be replaced before it fails, resulting in an emergency situation. Finally, a sewer jetter will be purchased. This equipment will enable the town to clean lines on a more routine basis at less cost and will reduce the potential for sewer backup and associated health threats.

Technical Assessment:

Background:

The City of Cascade is currently under an EPA mandate to correct deficiencies with the existing wastewater treatment facility. The facility consists of two lagoon cells located on an island in the Missouri River northeast of town. The objective of this project is to relieve the town of the restrictions it must now comply with by replacing the existing wastewater treatment system. In addition, the storm water system will be separated from the sanitary sewer collection system. Options presented include a choice between aerated versus facultative lagoons, as well as location and treated effluent disposal alternatives. The options are addressed in detail in the facility plan, along with engineer's cost estimates for each.

Approach:

Since being fined \$125,000 (reduced to approximately \$10,000) in 1994, the City of Cascade has organized its efforts to identify all of the problems associated with wastewater collection and treatment and to pursue viable alternatives to correct them. The town proposes to abandon the existing cells and construct a new treatment, effluent storage, and land disposal system at a site northwest of town. A facility plan was prepared in 1995 and amended in 1996 that adequately addresses the problems that must be corrected, along with options for a new system. The 1995 facility plan discusses treatment options including both aerated and facultative systems. In addition, four primary locations are discussed for construction of the new cells, as well as options for disposal of the treated effluent. The preferred alternative is to construct a facultative treatment system with storage cells and apply treated wastewater to croplands with sprinklers. The options are thoroughly discussed and the cost estimates are adequate. With the addition of some new information and refinement, the addendum to the facility plan prepared in 1996 is in basic agreement with the 1995 report.

Administration:

The project is scheduled for construction in 1997 and 1998. Phase I, to be financed with DNRC, CDBG, and SRF funding, includes the treatment and disposal facilities. TSEP funds, which theoretically could be delayed, will be used to fund collection system improvements and the purchase of a sewer jetter. Based on this proposed phasing, the construction schedule is compatible with funding availability.

Financial Assessment:

The estimated \$2,336,500 project is to be funded with CDBG, TSEP, and DNRC grants; a \$1,330,000 SRF loan; and \$6,500 in local contributions. Rates are proposed to be increased from \$4.37 per residential user month to \$35.30 if funding is obtained as applied for. This exceeds target rates for the state. Funding applications are pending, and the town has received approval for an SRF loan.

The facility plan provides construction cost estimates for each phase of the proposed project. The application includes a spending plan and budget, with budget justification. An 11 percent construction contingency is included. Engineering design and inspection represents 12 percent of the construction costs, and is consistent with engineering costs for similar projects. Estimated costs were derived primarily from historical bid data for similar projects.

The construction cost estimate and the total budget for the project appear adequate and justified. Applications for total financing are pending with TSEP, CDBG, and SRF. The project has been phased to begin construction in 1997 with DNRC, CDBG, and SRF funding. Phase I includes construction of the new treatment and effluent disposal system. Phase

II, with planned TSEP grant funding, will include lift station improvements, storm drain improvements, and the purchase of a sewer jetter to facilitate maintenance of the collection system.

Benefit Assessment:

A point source of pollution to the Missouri River will be alleviated. In addition, land application of treated effluent will provide irrigation benefits and associated agricultural enhancement. Because the treatment cells will be removed from the community, an odor problem will be prevented. The construction of a quality wastewater system will promote development within the community, and the waters of the Missouri River basin will be improved.

The application contains documentation of public support, and the project has received special authorization from the state for an SRF loan.

This project implements the objectives of the State Water Plan through an integrated approach to water quality and water quantity management. This remedial action is mandated by EPA and DEQ. The proposal addresses a surface water point source pollution problem that poses a threat to public health. The lagoons leaking into the Missouri River contaminate a source of drinking water for downstream communities.

Environmental Evaluation:

This project is in direct response to an EPA mandate to discontinue illegal, untreated effluent discharge into the Missouri River. With the exception of temporary adverse impacts during construction, this project will have positive and beneficial effects on the environment.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project. The project shall be designed and constructed in strict accordance with EPA and DEQ requirements.

Project No. 9

Applicant Name: Greenfields Irrigation District
Project Name: "J" Lake - Reregulation Reservoir

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 594,653	Project Sponsor
	\$ 699,649	USBR
	\$ 3,000	NRCS
	\$ 1,000	Teton County Conservation District
	\$ 1,000	Cascade County Conservation District

Estimated Total Project Cost: \$ 1,399,302

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Greenfields Irrigation District is proposing to construct a reregulation reservoir that will conserve water and physically reduce the volume of wasteway flows entering into the eroding Muddy Creek, a tributary to the Sun River near Vaughn, Montana. Muddy Creek has been listed among the top five state water quality problem areas for the last 17 years due to high sediment loads.

District wasteway flows increase the flow in Muddy Creek above that which naturally occurs. The proposed reservoir will regulate wasteway flows entering "J" wasteway, which is the largest single contributor of flow to Muddy Creek other than Muddy Creek itself. Increased flow has contributed to the severe erosion along Muddy Creek leading to water quality problems. An estimated 200,000 tons of sediment annually enter the Sun and Missouri River drainage from Muddy Creek. The reregulation reservoir will enable the district to re-use an estimated 8,000 acre-feet of water annually and reduce the sediment load of Muddy Creek by 15,000 to 20,000 tons per year.

Resulting public benefit is high. Streambank erosion has caused considerable loss of land along Muddy Creek. The lower Sun and Missouri Rivers have experienced the negative impact of sediment deposition. Considerable public support exists for this project. A very active Muddy Creek coalition is determined to remedy the problem and numerous remediation project and proposals are in progress. This project is supported by the district; Teton and Cascade county conservation districts; NRCS; USBR; Fish and Wildlife Service; Department of Fish, Wildlife and Parks; Ducks Unlimited; and the Sun River coordinator. It is absolutely essential that remedial action be taken to restore the environmental integrity of Muddy Creek and the lower Sun River. This proposal represents one of the single most effective means of reducing the volume of flow entering Muddy Creek.

Technical Assessment:

Background:

Greenfields Irrigation District has been delivering water since 1920. The full potential of 83,000 irrigated acres was achieved in the 1970s. Paralleling this development is a steady increase in irrigation return flows, including wastewater,

to Muddy Creek. As a result, increased stream flow rates and stream velocities combined with highly erosive soils have caused severe erosion of the Muddy Creek banks and bed. The current rate of sediment transported to the Sun River from this erosion is estimated at 200,000 tons/year. The overall goal of the project is to reduce the sediment loads in Muddy Creek, which empties into the Sun River. It is estimated that the project could reduce sediment loads by as much as 20,000 to 25,000 tons per year through reduced wastewater flows to Muddy Creek.

Approach:

The proposed project is to construct a reregulation reservoir at the irrigation district "J" wasteway. The "J" wasteway is the single largest contributor of irrigation district wastewater flows to Muddy Creek. The reregulation reservoir would capture and store wastewater normally entering into "J" wasteway. These waters would then be released back into the irrigation district canal system for reuse by irrigators. An estimated 11,000 acre-feet of water will be conserved annually through storage, reuse and improved water delivery capability within the irrigation system. Water savings will be quantified by an existing parshall flume equipped with a continuous recorder at "J" wasteway. Water quantity and sediment measurements at existing USGS gauging stations on Muddy Creek above and below "J" wasteway will be used to quantify the reduction in flows and sediment loads in Muddy Creek.

Administration:

The irrigation district manager, a licensed professional engineer, will complete the final design and supervise the project. Project design and environmental reviews will be coordinated with USBR.

Project construction is scheduled over a two-year time. Reservoir construction will be performed by the irrigation district. The district employs equipment operators, carpenters, steel-workers, concrete finishers, welders, laborers, and truck drivers. The district will advertise and award contracts for electrical work and supervisory control equipment.

Financial Assessment:

The proposed project's total cost is \$1,399,302. Greenfields Irrigation District's \$100,000 grant request is for construction costs (materials). The project sponsor will contribute \$58,700 for administration costs, \$54,000 for professional/technical costs, and \$481,953 for construction costs. USBR will contribute \$2,000 for administration costs, \$162,500 for professional/technical costs, and \$535,149 for construction costs. NRCS will contribute \$3,000 for professional/technical costs. Cascade County Conservation District will contribute \$1,000 for professional/technical costs. Teton County Conservation District will contribute \$1,000 for professional/technical costs.

Benefit Assessment:

An estimated 10 percent reduction in sediment loading occurring from Muddy Creek to the Sun River could potentially result from this effort. Wastewater flow from the irrigation district canal system would be captured in the "J" Lake reservoir. Approximately 11,000 acre-feet of this water will be reused in the irrigation district system for irrigation. This also should result in reduced outflows from Pishkun Reservoir.

This project would provide more efficient management and utilization of water in the Greenfields Irrigation District system. Management, improvement, and reclamation of the soil and fishery resources will also occur as a result of the project. An estimated 11,000 acre-feet will be conserved annually for irrigation use rather than being wasted to Muddy Creek. More importantly, this reduction in flow will contribute to the overall goal of restoring the environmental integrity of the Sun River below the mouth of Muddy Creek. The reservoir will create wetland wildlife and upland wildlife habitat.

Support from local entities, wildlife groups, state agencies, and federal agencies is documented. The project is part of a broader effort to reclaim the Sun River as a multi-use resource supporting a variety of public uses.

The project would directly implement sections of the State Water Plan through improved agricultural water use efficiency, water storage, and water quality improvements through reduction in non-point source pollution. The project further implements the plan through the use of federal funds to expand (1) non-point source pollution reduction, (2) drought management through improving water-use efficiencies in agricultural systems, and (3) solving severe resource conservation problems.

Environmental Evaluation:

During construction, disturbances of soil and vegetation will occur on an estimated 60 acres of land at the reservoir site, which may cause temporary increased sediment loading in Muddy Creek. Possible adverse affects of seepage from the reservoir may occur. Wind erosion on the reservoir bed causing dust may occur when the reservoir is dry.

Through the environmental assessment process, pursuant to the National Environmental Policy Act (NEPA) the project sponsor shall develop, document, and implement a plan to manage any sediment removed from the reservoir and to prevent or mitigate the effects of wind and water erosion and seepage loss. The environmental assessment completed pursuant to NEPA will satisfy requirements for an environmental assessment pursuant to the Montana Environmental Policy Act (MEPA). In the event NEPA does not apply to this project, the project sponsor would need to comply with the requirements for environmental review under MEPA.

The project sponsor may be required to obtain a Montana Pollution Discharge Elimination System permit from DEQ to address the potential impacts from wind erosion (required for any disturbance over 5 acres in size). If the project area is determined a wetland pursuant to the Clean Water Act, a 404 permit, administered by the U.S. Army Corps of Engineers, will be necessary prior to construction. The project sponsor will need to submit complete plans to DNRC Dam Safety to determine whether the structure is high-hazard. None of the adverse environmental impacts are so significant as to require preparation of an environmental impact statement.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

A plan to measure and document the impacts to water quantity and quality in Muddy Creek after project construction shall be included in the scope of work. Original specifications, designs, and respective revisions shall be submitted to and approved by DNRC before bids are solicited; by reference, these documents shall be included in the grant agreement. All appropriate state and federal permitting requirements shall be satisfied prior to construction.

Project No. 10

Applicant Name: City of Valier
Project Name: Wastewater Treatment Facility Upgrade

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 200,000	SRF Loan
	\$ 500,000	TSEP Grant
	\$ 400,000	CDBG Grant

Estimated Total Project Cost: \$1,200,000

Amount Recommended \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The Valier wastewater treatment facility, a single-cell lagoon, has two distinct and serious problems. First, accumulation of sludge over the years has significantly decreased the storage capacity of the lagoon, reducing the detention time of the lagoon to 51 days (compared to the Water Quality Bureau requirement of 180 days). As a result, the effluent discharged by the lagoon is improperly treated; biological oxygen demand (BOD) levels are two times higher than state standards and total suspended solids (TSS) levels are 25 percent higher than permitted. The second problem is that porous soils in the bed of the lagoon allow wastewater to percolate, or exfiltrate, at a rate of 74 million gallons per year, which is 42 times the rate of allowed under state standards. If allowed to continue, this excessive rate of exfiltration will likely cause contamination of soils and groundwater.

The proposal to upgrade the facility would solve these problems by removing accumulated sludge, dividing the single lagoon cell into three cells, and adding aeration to provide proper treatment. The lagoon would be lined with an impermeable liner to prevent exfiltration. By adding aeration and increasing storage capacity lagoon, BOD levels will be reduced from 76 mg/L to 30 mg/L and TSS levels will be reduced from 127 mg/L to 100 mg/L, conserving 84 million gallons of water per year by preserving the water quality. By adding an impermeable liner to the lagoon, nearly 74 million gallons of water per year will be conserved by the prevention of exfiltration from the lagoon.

The benefits of the project are that (1) water quality will be preserved through the proper treatment of wastewater, (2) water will be conserved by eliminating the exfiltration of wastewater and (3) water management will be improved with a more effective and efficient wastewater treatment system.

Technical Assessment:

Background:

The City of Valier's wastewater is currently treated in a single-cell, unlined lagoon. The two distinct problems with this system are: (1) excessive sludge accumulation resulting in inadequate wastewater detention time and therefore inadequate treatment, and (2) excessive exfiltration (estimated to be 140 gallons per minute) of wastewater through porous soils under the lagoon. DEQ has issued the town a temporary discharge permit with relaxed standards for BOD and TSS until the lagoon improvements are completed. Valier's goal is to complete the needed improvements before that permit expires.

Approach:

The town's recently completed wastewater facility plan identifies and compares five different solution alternatives. The most cost-effective and least expensive alternative for correcting the lagoon problems is the alteration of the existing facility into three lagoon cells with aeration. This alternative will result in an aerated, three-cell, synthetically lined lagoon that is expected to meet DEQ's discharge standards of a BOD of 35 mg/l and a TSS level of 100 mg/l. Exfiltration from the lagoon floor will also be prevented with the use of an impermeable synthetic liner.

Administration:

The only additional information required before the final design may proceed is a one-year inflow and/or infiltration study required by DEQ to determine actual flow data needed for final lagoon sizing. If the study is begun with grant funds in the summer of 1997, final project design can not proceed before the summer of 1998. This process will delay construction until 1999. However, a delay in the project's completion date will not reduce the benefits of the project.

Financial Assessment:

In order to finance this project, the applicant is seeking a \$200,000 SRF loan, a \$500,000 TSEP grant, a \$400,000 CDBG, and a \$100,000 grant from DNRC. The total amount of funds is necessary to complete the project. Valier should successfully obtain an SRF loan, since DEQ helped to fund the recently completed wastewater facility plan on which this DNRC grant application is based.

With the funding structure proposed in the application, the combined monthly sewer and water charges for the community will be \$2.50 per month higher than DOC's projected target rate of \$36.40.

The construction cost figure used by the applicant is \$50,000 higher than that included in the facility plan prepared by the town's engineering consultant, due to facility plan cost reductions submitted after the DNRC application deadline. The total project cost of \$1,200,000 is, therefore, overestimated by approximately \$50,000. However, the cost of a one-year inflow and/or infiltration study is excluded. DEQ requires the study before the final design phase of the project may begin. The cost of this study is variable, depending on whether the flows are quantified or simply identified by television inspection. The \$50,000 construction cost discrepancy could be allocated, at least in part, toward this purpose.

Even though all of the funding sources are not yet secured, documentation provided in the application supports the project's feasibility.

Benefit Assessment:

The City of Valier has not consistently met the requirements of its discharge permit, and the existing one-celled lagoon has been leaking approximately 140 gallons per minute of wastewater through the lagoon sides and bottom. After the proposed improvements are completed, the 10 million gallons of effluent currently discharged each year will be improved to comply with DEQ standards. Moreover, the impermeable lagoon lining will eliminate the leakage problem. The 520 residents of the town and those people living nearby will directly benefit from the wastewater facility upgrade through protection of both surface and groundwater quality, and improved efficiency.

This project indirectly supports the State Water Plan's objective of integrated water quality and quantity management and policy of protection of local groundwater quality. This project directly implements objectives of the "Drought Management" section of the plan.

Environmental Evaluation:

Since all of the proposed lagoon improvements will be made within the present boundaries of the facility, no new areas will be adversely affected by the project. The only adverse impacts expected are temporary disruption of air quality and noise during construction. The primary environmental benefits from the lagoon improvements are improved effluent quality and prevention of excessive exfiltration of wastewater to the groundwater. As part of their plans and specifications review of the proposed wastewater system improvements, DEQ would complete an environmental assessment.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

A one-year inflow and/or infiltration study must be completed by the City of Valier prior to final design of the lagoon improvements. This study can be completed using funds within the \$1,200,000 cost of this project. Original plans and specifications shall be submitted to and approved by DEQ prior to construction.

Project No. 11

Applicant Name:	Lakeside County Water District	Loan Only
Project Name:	Lakeside Water System Improvements	
Amount Requested:	\$ 600,000	Loan
Other Funding Sources:	\$ 500,000	TSEP Grant
Estimated Total Project Cost	\$1,100,000	
Amount Recommended	\$ 600,000	

Project Abstract: (Prepared and submitted by the applicant)

Lakeside County Water District (7-13-22 & 23, MCA) serves 200 users. The first water system consisted of a well and hundreds of feet of 1-inch and 1¼-inch main. In 1978 an improved water system was constructed that included the purchase of a second well, construction of a 200,000 gallon storage tank, and new water mains, 2 to 6 inches in diameter. Major portions of the old system were connected to the new improvements. There were no meters installed on the wells or users. In most cases the users were connected using the old service lines. The system in 1978 supplied domestic water with very limited fire flows or peak flow capabilities.

The district added a third well in 1987. Even with this well in production, summer usage drains the system. Usage is very high because the user charge is a flat rate for unlimited water. Sprinkler rules for summer use regulate consumption but not enough to allow the wells to maintain a full storage tank.

Lakeside is a rapidly growing community on the west shore of Flathead Lake. Growth or new connections to the water system ceased in July 1995, when the board passed a resolution (moratorium) prohibiting new connections.

In 1995, a major fire destroyed the Lakeside Marina. The fire department responded quickly. Fire flows from the small diameter mains hindered the department's efforts to suppress the fire. The entire structure and contents were destroyed.

The proposed project includes larger mains to increase peak flow and fire flow capacity, a new well to increase supply, a meter for the original well, and meters for all users. After improvements are complete, water rates will be adjusted to a metered billing system. Rates will be set to recover the costs of the system, costs of operation and maintenance, and debt retirement of production. The metered rate will promote conservation. Currently millions of gallons of groundwater are lost or wasted. The improved system will promote wise use of the resource.

Technical Assessment:

Background:

The Lakeside County Water District has low water pressures, inadequate volumes of water, and insufficient fire flows. The district has placed restrictions on residential users to conserve water and has implemented a moratorium on further hookups to the system until the water shortage problems have been addressed. The original system was not designed to accommodate the growth and fire flow demands experienced by the area. This was evidenced during a fire in 1995 that destroyed the Lakeside Marina. The current system serves around 200 users.

In July 1996, a severe water shortage necessitated the immediate construction of an additional well to augment the existing system. A short-term loan of \$140,000 was obtained from the Montana Board of Investments through its INTERCAP Loan Program. \$90,000 in DNRC Emergency Grant Funds were provided to the Lakeside County Water District to be used as security for the INTERCAP loan until a debt election could be used to establish the necessary security. The debt election met with approval, and the Emergency Grant Agreement was terminated. The INTERCAP Loan will be repaid with the DNRC long-term loan requested in this application.

Approach:

The proposed improvements include installing individual water meters, installing a new well (this has already been completed due to an emergency water shortage), installing larger water mains, and centralizing all pump controls. The installation of water meters is intended to encourage conservation and reduce water demands. Installation of a new well will satisfy the lack of water supply. The new larger water mains will increase domestic flows and pressures and will increase available fire flow volumes in the commercial area. The inadequate water supply problem became so severe during the summer of 1996 that DEQ issued a health advisory and the district was forced to proceed with the water well installation.

The technical documentation presented is sound. The proposed improvements are feasible and appear to represent the most cost-effective options available. Although the proposed project will provide fire flow to the areas with most need (i.e., commercial), some portions of the district will still not have adequate fire protection. The district has identified phase II and III improvements to completely update the system.

Administration:

The district will need to obtain approvals from DEQ prior to construction. Water rights and land acquisitions must be obtained (or already have been) by the district for the new well. The project budget is reasonable for the proposed scope

of work. The district states no activities will be undertaken until all funding is approved.

Financial Assessment:

The proposed funding strategy for the \$1,100,000 project consists of a \$600,000 DNRC loan and a \$500,000 TSEP grant (1996 application has been made). The project budget includes \$35,850 for administration (\$27,600 DNRC), \$5,000 for land acquisition; \$126,475 for engineering (\$56,475 DNRC); \$871,390 for construction (\$455,640 DNRC); and \$61,285 (\$60,285 DNRC) for contingency costs.

The applicant states that the average user rate is currently \$20 per month for debt retirement and operation and maintenance. Without DNRC and TSEP funding, the rates will be \$75.00 per month, with DNRC and TSEP assistance, the rates will be \$45.00 per month. The estimated costs and project budget appear reasonable. The project is financially feasible, assuming requested funding is attained.

Benefit Assessment:

This project will achieve benefits through water conservation, improved public health and safety, improved fire protection, and increased water system reliability. The local fire department must rely on transported water to protect the community. Improved fire flows will greatly benefit all members of the community through increased safety. The installation of meters would result in both water conservation and a more equitable distribution of the costs necessary to operate the system. The entire Lakeside community will benefit from a more reliable, up-to-date water system.

This project implements objectives of the State Water Plan through benefits to water quality and conservation. The improved system will decrease consumption and thereby help prevent aquifer overdraft. Metering all users will promote additional conservation through improved efficiency of municipal and industrial users.

Environmental Evaluation:

Long-term adverse environmental impacts are not anticipated as a result of this project. Short-term disturbances such as noise, dust, and vegetation disruption will likely occur during the construction period but should be tolerable if proper precautions are taken. Most disturbances will occur in areas already impacted during original installations.

Recommendation:

A loan of up to \$600,000 is recommended for the water system improvements proposed by the Lakeside County Water District. The loan should be provided commensurately with the project sponsor's ability to repay the principal and interest according to the terms specified in a DNRC bond purchase agreement. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Since the district has already proceeded with a portion of the proposed improvements, (new well estimate \$120,000) the scope of the project may need to be amended. It is recommended that the district consider applying any extra monies available toward the proposed phase II water system improvements.

Project No. 12

Applicant Name: Beaverhead County Board of Commissioners
Project Name: Big Hole River Return Flow and Water Budget Study

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 3,000	Beaverhead County
	\$ 40,300	MBMG
	\$ 45,000	USBR
	\$ 30,000	USGS
	\$ 6,500	DNRC - WRD

Estimated Total Project Cost: \$ 224,800

Amount Recommended \$ 100,000

Project Abstract: (Prepared and submitted by applicant)

Ranchers in the Big Hole basin of southwestern Montana have long been aware of the importance of return flows in the management of their water. Similar to a reservoir system, flood irrigation and stock water that infiltrates the ground during the spring and early summer is held in the basin's aquifers. It then flows back to the river system in the late summer and fall.

Because the river supports a blue-ribbon trout fishery and the last remaining fluvial arctic grayling fishery in the lower 48 states, recent water shortages (during 1977, 1988, and 1994) have placed pressure on ranchers to change traditional water management practices without consideration of the possible benefits of return flows. To assess the impact of return flows, an extensive data collection network is needed to quantify both their amount and timing. Through this proposed study, stream and groundwater flow data will be gathered throughout the year to obtain "snap shots" of water availability in the basin.

The Beaverhead County Board of Commissioners will contract with the Montana Bureau of Mines and Geology (MBMG), DNRC Water Resources Division (WRD), the U.S. Geological Survey (USGS), and USBR to complete the proposed work. MBMG will be the lead technical agency, coordinating the efforts of the other parties.

The water budget and return flow information from the study will educate water users (water-rights holders, recreationists, municipalities, etc.) about the role of return flows and will resolve some of the differences that occur due to lack of data. The Big Hole Watershed Committee (a group composed of representatives from the local ranching community, the Beaverhead Conservation District, the Beaverhead County Board of Commissioners, the Butte-Silver Bow Water Utility, the Montana Power Company, the Beaverhead County Planning Board, the Big Hole Tourism Committee, the Skyline Sportsmen, Big Hole River Foundation, Trout Unlimited, and the Nature Conservancy) will utilize the information to make water-management decisions that enhance both agriculture and fisheries in the basin.

Technical Assessment:

Background:

The Big Hole River watershed supports a variety of uses, including irrigation, stock watering, fishery and wildlife habitat,

domestic water supply, municipal water supply, and recreation. As a result, there is a lot of interest in the water management practices of the Big Hole River water users. Unfortunately, there is limited knowledge of the effects of current and proposed water management practices in the basin. Thus, the goals of this project are threefold:

- (1) To collect surface and groundwater data needed for Big Hole River water users to evaluate the management of water within their basin;
- (2) To construct a water budget for the basin to help understand what happens to river flow, groundwater flow, and precipitation as a result of irrigation and livestock diversions, evapotranspiration, municipal use, etc.

The objective of the study is to supply the Big Hole Watershed Committee (BHWC) with the data necessary to assess a variety of water-management options. With this information, BHWC can develop strategies to handle the needs of current and future fisheries, irrigation, domestic, and municipal water use concerns.

Approach:

Networks of wells, precipitation/evaporation gauges, and stream gauging stations will be located throughout the Big Hole basin and will be monitored for at least two years. This monitoring will provide the groundwater, surface water, and precipitation/evaporation data needed to assess the effects of return flows, to construct a water budget for the basin, and to build a water-management model. MBMG will collect water measurements from existing domestic and stock wells in the basin. In some areas, monitoring wells will be installed to supplement the existing data. Precipitation will be measured using existing precipitation gauges and gauges scheduled to be installed during this project. Three gauging stations will be installed in the Big Hole River, making a total of five available in the basin. In addition, flow measurements will be made on canals and tributaries.

Quarterly progress reports will be generated and submitted to BHWC, and the DNRC Conservation and Resource Development Division. In addition, presentations will be given to BHWC to explain ongoing work and significant findings. At the conclusion of the study, a final report will provide summaries and interpretations of the following:

- (1) Hydrology and water resources of the basin (precipitation, evapotranspiration, surface water, groundwater);
- (2) Monthly and annual water budgets;
- (3) Return flows from irrigation.

In addition, the information gathered will be used to create a water-management model for the Big Hole basin. The grant application states that the water-management model will be used “to obtain estimates of the quantity and timing of return flows.” First, the model should be used to replicate the observed data. If the model is found to be capable of duplicating observed data, it may be used to predict differences in river flow conditions over time, or conditions under different water management scenarios. The model should be developed, however, to first emulate actual measured data.

Administration:

The Beaverhead County Board of Commissioners will contract with MBMG, WRD, USGS, and USBR to provide the hydrological expertise necessary to complete the tasks outlined in the proposal. MBMG will be the lead technical agency on the project and will coordinate the efforts of the other participating agencies.

Field data are scheduled to be collected beginning the spring of 1997 through the fall of 1998. From May through September of each year, precipitation, evaporation, and groundwater levels will be measured twice monthly. Surface-water flows and stages will be measured once a month during this same period. Stream gauge and precipitation data gathered by MBMG, WRD, USGS, and USBR will be supplemented with measurements collected by local residents throughout the study.

Financial Assessment:

The total budget for this project is \$224,800, of which \$100,000 (44 percent) is requested from the Renewable Resource Grant & Loan Program. Of the requested grant funds, \$97,000 is allocated to professional/technical costs and \$3,000 will be used for project administration. The project sponsor will provide \$3,000 in match funding. MBMG will contribute \$40,300, USGS will provide \$30,000, USBR has allocated \$15,000 for in-kind services and \$30,000 in match funding, and the Water Resources Division of DNRC will provide \$6,500 in match funding. The overall costs of the project are reasonable, and the budget is sufficient to complete the scope of work presented.

Benefit Assessment:

This study will assist land managers in the optimization of the basin's water resources. The efficient use of water in the Big Hole will benefit agricultural and recreational interests as well as the domestic uses, fish, and wildlife that depend on this resource.

This project has strong support from local, state, and federal agencies in addition to local Big Hole River users, and various organizations. The results of this study will be used to manage and conserve the Big Hole River basin water, an important state of Montana water resource.

This project implements several priorities of the State Water Plan. The plan supports watershed-specific investigations, including modeling of local hydrogeological conditions for management plans in high-priority basins. The plan also supports voluntary improvements in water-use efficiency. This model will help ranchers select management practices that maximize water for irrigation and stock watering while maintaining instream flows.

Environmental Evaluation:

It was determined that no adverse environmental impacts would result from the activities associated with the proposed project. This determination was made based on the fact that the project consists of a hydrologic study of the Big Hole River basin and includes activities that should result only in minor impact to the environment. No environmental assessment was completed for this project.

Drilling monitoring wells could pose a threat to groundwater quality if not done properly. Any monitoring wells drilled and not used for future work should be abandoned per the requirements of the Montana Water Well Contractors Act. Surface impacts associated with drilling operations at agricultural sites should be mitigated through post-drilling reclamation activities, including seed bed preparation, seeding, and soil mixing.

For the installation of each stream gauging station only a small area (about 80 square feet) of the stream bank will need to be disturbed. Surface impacts associated with stream gauge installation should be mitigated with good construction practices. USBR and WRD experts in stream gauge installation will be responsible for conducting the work and will apply for the appropriate permits.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 13

Applicant Name: Montana Tech, The University of Montana, Bureau of Mines and Geology
Project Name: Groundwater Protection and Education in Montana Schools

Amount Requested: \$ 99,959 Grant
Other Funding Sources: \$ 8,408 MBMG
\$ 5,556 DEQ

Estimated Total Project Cost: \$ 113,923

Amount Recommended: \$ 99,959

Project Abstract: (Prepared and submitted by applicant.)

This project provides an innovative approach to protection of groundwater supplies and groundwater education. Primary and secondary students at schools not using municipal water supplies will participate in developing a wellhead protection plan for their schools' wells. The elements needed in developing a wellhead protection plan include defining the wellhead protection area, identifying potential contaminant source areas, managing the wellhead protection area, and developing a contingency plan should the water supply become contaminated. Developing and implementing such a plan will require an interdisciplinary effort incorporating science, computers, math, social studies, and communications. Eight schools are currently participating in a project to develop wellhead protection plans for their school wells.

The initial success of this project and the increased interest in educational opportunities such as this has led to a request for funds so that 12 more schools can develop individual wellhead protection plans for the wells that supply their drinking water. These schools are located in different areas throughout Montana and are representative of the diverse land uses, geologic, and hydrogeologic environments throughout the state.

The 1986 amendments to the Safe Drinking Water Act specified that each state must develop a wellhead protection program. Montana's wellhead protection program was approved by the EPA in 1994 and is now part of the State Water Plan. Wellhead protection under the statewide program is on a voluntary basis. Schools are classified as non-community public water-supply systems and fall under the statewide wellhead protection program. Currently, state funds are not available to assist community and non-community water systems in developing a wellhead protection plan. The proposed program will provide resource protection as well as an excellent opportunity to enhance education through practical application of skills learned in the classroom and field. The final result of this effort will be individual wellhead protection plans for small, non-community systems that may otherwise not be able to afford to protect such an essential resource.

Technical Assessment:

Background:

The importance of protecting the nation's underground sources of drinking water was demonstrated by the 1986 Amendments to the Safe Drinking Water Act, which created the Wellhead Protection Program. The objective of the Wellhead Protection Program is to protect aquifers that supply wells and well fields that contribute drinking water to public water supply systems.

Several of the 146 schools in Montana that use groundwater sources have been in violation of the maximum contaminant drinking water levels mandated by federal law. Boil orders were given for the Melville and Amsterdam Schools due to fecal positive water samples. Nitrate violations were found in Demersville School (Kalispell), Turner School, and Whitewater School. Pesticides have been detected in samples from the well at the Edgar School. These schools had to install expensive equipment to filter water and remove contaminants. At times, schools have had to bring in bottled water until contamination was addressed.

Approach:

This project will result in the creation of 12 certified wellhead protection plans for 12 rural school drinking water systems. The local communities will have an opportunity to use the schools' efforts as a demonstration on how they can protect their own drinking water supplies.

Teachers and students will learn the importance of maintaining the quality of drinking water supplies and learn the basic principles of the groundwater and hydrogeologic systems of their area. Also, teachers and students will receive training and gain experience in assessing and protecting their local groundwater resources. The formation of a local coordinating team will extend the school effort to the larger community, thereby linking classroom educational experience to community improvements.

The chosen alternative of training teachers to teach their students about groundwater resources and the value of wellhead protection has been success.

Administration:

MBMG currently has a project to develop wellhead protection plans for eight schools that began using Renewable Resource grant funds in 1995. A teacher training workshop was held in April 1995. Equipment has been secured for each of the schools.

To get things moving, MBMG has been selecting specific well sites that each school should inventory. The schools began collecting well inventory and water quality data in September 1996. Final project results are expected in the fall of 1997. To date, the project has been received with a lot of enthusiasm. Twelve additional schools have already expressed interest in participating in the wellhead protection project.

Financial Assessment:

The total project cost is \$113,923. Of the \$99,959 in grant funds requested, \$52,377 will be allocated to professional costs and the remaining \$47,582 will be used to cover technical expenses. Match funds comprise 12 percent of the total project cost. The project sponsor will contribute \$8,408 in match funding for professional services and DEQ will contribute \$5,556 in professional services. Indirect costs identified in the project budget are not an eligible source of

match funding.

The project manager/hydrogeologist salary is based on 12.8 months of work over the two-year grant period. This salary reflects the time involved to gather site-specific information, organize and plan workshops, visit each school three times to help with project implementation and field trips, provide assistance in delineating the wellhead protection areas, and prepare required reports.

Laboratory costs include analyses pertinent for non-community public water supply systems such as volatile organic compounds, nitrates, and inorganics. Funds for equipment will be used to buy each school a water-level indicator, specific conductivity meter, and pH meter. The schools will keep the equipment to continue teaching students. Each school will be allotted \$1,440 to defray the costs of field trips, videos, and additional equipment or supplies.

This grant will fund an ongoing program. The department and the legislature have discouraged ongoing grant funding to support state programs. The applicant is encouraged to seek a more reliable source of revenue for this purpose.

Benefit Assessment:

This project is supported by DEQ, Montana Watercourse, Project WET, and Montana Rural Water Systems, Inc. The project will directly benefit the students and employees of 12 public schools across Montana. Additional beneficiaries would be the groundwater users in the 12 areas this project will address. The benefits of this project would substantially exceed the project costs if only one of the groundwater protection plans prevents groundwater contamination.

This is a planning and education project that directly implements the State Water Plan policy objective of water quality and quantity long-term planning. It is consistent with the State Water Plan's proactive approach to groundwater management, prevention of groundwater pollution to sustain current and future beneficial uses, development of a local groundwater management plan, and participation with EPA in groundwater protection programs. Montana's Wellhead Protection program was approved by EPA in 1994 and is now part of the State Water Plan. The project would help implement Montana's wellhead protection program required by federal law.

Environmental Evaluation:

There are no long- or short-term adverse environmental impacts anticipated as a result of this project. No permits are necessary for project implementation.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$99,959. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

University indirect costs and university salaries included in the legislatively approved university budgets and authorized in the 1997-98 appropriations bill shall not be reimbursed with grant funds.

Project No. 14

Applicant Name: Lake County Land Services
Project Name: Technical Study of Conventional and Advanced Septic Systems

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 5,000 Lake County

Estimated Total Project Cost: \$ 105,000

Amount Recommended \$ 100,000

Project Abstract: (Prepared and submitted by the applicant)

This project will provide state and local regulators, as well as property owners, with information on the performance of individual on-site wastewater treatment and disposal systems. Specifically, the project will evaluate the performance of two such systems utilizing level two treatment and four drain field trench types. Information will be provided through the collection and cataloging of completed research and through field demonstrations.

New on-site systems are permitted and installed daily in Montana. The assessment of the type of system best suited to a particular site is often difficult because of the lack of reliable engineering and system operation data. The information that is available is often incomplete, not easily accessed, or not applicable to Montana's soil conditions. As a result, permit requirements may not reflect reality, and inadequate systems may be installed. In some cases, new technologies that may work well in Montana may not be allowed. This project will provide factual scientific information upon which regulators and property owners can rely to determine the best on-site sewage treatment and disposal system for an individual parcel of land.

Poor management of on-site wastewater disposal today has the potential for major economic impacts in the future. An aquifer degraded by wastewater is not desirable for domestic use and can preclude the continued development of property and/or the continued use of existing property. Clean water is a necessity for the survival and prosperity of Montana in the future.

Technical Assessment:

Background:

Growth in Montana, in conjunction with the need to maintain the state's existing high-quality waters, has resulted in the need to refine the design approach for construction of on-site waste disposal systems. Currently, there are no data on the performance of OWTDS's that are specific to climactic and soil conditions here in Montana. The proposed project is intended to provide design, construction, and performance data on conventional and advanced septic systems, specific to Montana's climate. Current design practice is based on outdated information developed outside of the state.

Approach:

The proposed project is a technical study designed to evaluate conventional and advanced septic systems. Both conventional septic tank/drain field systems and advanced (Level II) on-site treatment systems will be evaluated. The final

product of this study will be the development of a data base summarizing existing information regarding on-site system technology. Also, the study will result in a final report summarizing the results of the field studies, including recommendations on improving the use of on-site systems in Montana. The majority of the proposed work will be contracted for completion by a consulting firm.

Upon grant funding, the project sponsor would begin to identify the location of testing sites. The sponsor would enter into agreements with private individuals to assist in the construction of new septic systems at building sites and arrange for ongoing monitoring. Grant funding would be used only to construct those portions of the system that are unique to the study, primarily the drain field.

Primary work tasks include research on existing information regarding on-site system technologies and maintaining this information for public and agency use in some type of data base. Following the research of available technical information, field studies will be undertaken involving the construction of pilot systems. Extensive data gathering and performance testing will be performed on these study systems. A final report will be prepared to draw conclusions from the systems as they function in Montana's climate. This information will be available for the future planning and design of these systems.

The project is anticipated to be completed in three years. Research, planning, and construction will occur in the first nine months of the project. The following 27 months will be devoted to implementation of the field study plan and reporting of the project results.

Administration:

Lake County Land Services, a division of Lake County, will provide administrative support to the project. The majority of the work outlined in the proposal will be performed by contracted personnel. Project oversight, background research, preparation of sampling and monitoring plans, system design, direction of field work, and compilation and evaluation of results will be performed by a contracted person or firm with knowledge of on-site wastewater treatment and disposal systems.

Lake County Land Services should coordinate the work plan for this project with DEQ to ensure that the final report has statewide applicability. Other counties active in the development of new technology may want to participate in the project.

Financial Assessment:

Total project cost is \$105,000. Grant funded expenses in the budget include \$42,870 for professional consultants, \$40,580 for sample analysis and associated technical fees, \$10,550 for construction of the field study systems, and \$6,000 for project administration. The project sponsor will contribute \$5,000 in match funding to the project for professional services. The estimated project budget is well developed and will adequately support anticipated costs and necessary work tasks.

Benefit Assessment:

This project, through the development of appropriate treatment technologies, could serve to protect or improve existing water quality on a statewide basis. Rapid subdivision growth in Montana, typically utilizing septic systems, has elevated the need for scientific information of this nature.

The completion of this study will have indirect beneficial effects on the environment by developing technology that will better predict and improve the performance of septic systems. This work should help to prevent the improper use of septic

systems, thereby avoiding the degradation of surface and groundwater. The investigation of advanced septic systems should result in improved technologies, which could benefit water quality by reducing the discharge of pollutants. Generally, bacterial and nitrate contamination are the primary sources of concern originating from the use of septic systems.

This project implements the policy objectives of the State Water Plan by promoting the protection and sustainability of Montana's water resources for existing and future uses.

Environmental Evaluation:

There are no short- or long-term adverse environmental impacts anticipated from implementation of this project.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor should coordinate activities with DEQ to facilitate applicability of the work effort on a state- wide basis.

Project No. 15

Applicant Name: Gallatin County Health Department Local Water Quality District
Project Name: Groundwater Evaluation And Monitoring Project

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 138,000	USGS
	\$ 81,364	Project Sponsor

Estimated Total Project Cost: \$ 319,654

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Recent residential and commercial development in and around the Gallatin Valley has raised concerns regarding the sustainability of the quality and quantity of groundwater in the underlying aquifers, which provide the sole source of drinking water to more than 17,000 people. Recognizing the importance of maintaining the high quality of its water resources, Gallatin County recently established a Local Water Quality District (LWQD), which is currently being implemented. To be effective, the LWQD will need readily accessible hydrogeologic information to assist decision makers, and against which to compare future changes in water quality and availability.

LWQDs are relatively new to Montana. This district has been created to help answer questions regarding potential risks to water resources by providing sufficient hydrogeologic information to be used when planning development. The

LWQD's hydrologist will interpret hydrogeologic information so it can be used for land-use decisions. However, time and funding will not be available to interpret data concurrently with acquiring new information and assembling existing information in a usable format. The proposed project is designed to "jump-start" the LWQD by providing the district with easily accessible and geographically indexed hydrogeologic data, along with an established groundwater monitoring network. This project will examine possible impacts of existing older subdivisions. This study will also address the large-scale residential and commercial development currently taking place in specific vulnerable areas where the use of on-site sewage disposal is ever increasing. Results of this project will provide locally derived land-use guidance by providing the acquired information to elected decision makers and the public. This will be an innovative pilot program for Montana. Techniques developed and employed during the project will provide a model for assisting future LWQDs as they become established throughout the state.

Technical Assessment:

Background:

Gallatin County recently established a Local Water Quality District (LWQD) to address the issues and potential impacts of growth and development on the groundwater supply in the Gallatin Valley. The LWQD includes over 500,000 acres in Gallatin County. As a result of rapid growth in the valley, adequate groundwater data are not readily available to be used by Gallatin County for planning purposes. A thorough understanding of the hydrogeology of the Gallatin Valley might help prevent future potential adverse impacts to the groundwater resource. The LWQD is requesting monetary support to be used to "jump-start" the newly formed LWQD so that it can serve the citizens of Gallatin County in a timely manner.

Approach:

The proposed project will involve the compilation of existing data into a usable format, and incorporating that data with new data obtained from groundwater monitoring and field investigations. The objectives for this project include the following: (1) establishment of a district-wide groundwater monitoring network to evaluate groundwater quality and quantity questions; (2) examination of the effects of existing and new residential and commercial development on groundwater quality and quantity; (3) expansion of the existing hydrogeologic database to include previously undeveloped areas in the LWQD; and (4) merging of the data with the existing Gallatin County Planning Department GIS database.

Administration:

The LWQD has done a good job of organizing support for the project from public and private parties. USGS will be a partner in the groundwater monitoring portion of this proposal. MBMG and DNRC databases will be accessed during the review and data compilation period. In addition, Montana State University will provide assistance with sampling. The proposal indicates that the project can be completed in the two-year time frame outlined in the schedule.

The proposal does not specifically state how the project data will be coordinated with the Montana Ground Water Assessment Act programs. The proposal should be revised to describe how well inventory, water level, and other information collected will be transferred to the Ground Water Information Center. MBMG personnel should be included early in the project to help plan coordination between the various agencies to assure that the data collected meet requirements of the Montana Ground Water Assessment Act.

Financial Assessment:

The proposed project's total cost is \$319,654. Gallatin County LWQD grant request of \$100,000 includes \$66,650 for

professional services, and \$33,350 for technical services. The project sponsor will contribute match funding of \$50,000, comprised of \$28,100 for an MSU field assistant and \$13,650 for project administration. In addition, LWQD will contribute in-kind match services of \$31,654. If federal funding is available, USGS will contribute \$138,000 in project match funding and in-kind services. The project is financially feasible as proposed.

Benefit Assessment:

The proposed project would provide the hydrogeologic data necessary to evaluate and plan for growth. The project will provide valuable information for resource management and protection by compiling the hydrogeologic data necessary to help county officials, planners, and key groups make informed decisions.

Public support from federal, state, and public entities and private citizens is documented. The project will provide measurable benefits to the community and will continue beyond the life of this grant.

This project implements the policy objectives of the State Water Plan as a demonstration planning project for water quality management. Furthermore, the project helps protect beneficial uses by promoting informed land-use decisions.

Environmental Evaluation:

It was determined that no adverse environmental impacts would result from activities associated with this project.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

MBMG personnel should be included early in the project to help plan coordination between the various agencies to assure that the data collected meet requirements of the Montana Ground Water Assessment Act.

Project No. 16

Applicant Name: Bloomfield School District
Project Name: Geo-Source Heat Cool System

Amount Requested:	\$ 18,875	Grant
Other Funding Sources:	\$ 500	Project Sponsor
	\$ 2,000	Bloomfield Electrical Cooperative
Estimated Total Project Cost:	\$ 20,875	
Amount Recommended	\$ 18,375	

Project Abstract: (Prepared and submitted by applicant.)

The Bloomfield School is located 25 miles from Glendive and serves 27 students with 3 teachers. It is a rural building that is a vital link for community activities.

The structure has existed as such since the early 1940s when the acreage upon which it is located was deeded to the district.

At present, the 2,700 square-foot building is heated with a propane fossil fuel system. The furnaces were installed in the basement 15 years ago. At that point in time, Montana Uniform Fire & Building Code (UMC) stated that liquefied petroleum gas-burning appliances should not be installed in basements where heavier-than-air gas might collect (Section 504(f) UMC). The Deputy State Fire Marshall has recently mandated that our system be removed from the basement and replaced with an appropriate system that meets code.

After considering several options, Bloomfield School Board concluded that the geo-source heat/cool system would best fulfill the needs of the building. The system will operate more efficiently than ordinary heating and cooling systems.

It is dependable, requires low maintenance, and is safe and clean. There are no flames, no fluc, no odors, and no danger of fire or carbon monoxide poisoning. It emits no CO₂, which is considered a contributor to air pollution. There are no unsightly, noisy outside tanks or units.

This system will heat the school in the winter months, cool it in the summer, and provide hot water for various needs. All of these benefits will be provided at a savings of approximately \$1,000.00 per year for the school.

In addition to being an efficient management of our natural resources, it will also provide an environmentally sound heating system. Geo-source systems have been installed in the Bloomfield area and are a proven efficient system. The installation of this system would allow the school to continue operating efficiently in the Bloomfield community.

Technical Assessment:

Background:

The Bloomfield School District's heating system does not comply with state code. The deputy fire marshall has issued an order to move the propane heating system out the basement or replace it with a system that satisfies code requirements. After evaluating several options, the district determined that installation of ground-source heat pump offered the most desirable and efficient alternative. The geo-source system was chosen on the basis of cost, safety, efficiency, and space requirements.

Approach:

The ground source heat pump works according to the following principle: lengths of high strength plastic pipe are buried in a series of loops in the ground; the proposed system will consist of 4 trenches approximately 8 feet deep and 250 feet long; liquid is then circulated through the buried pipes. In the winter, the liquid in the pipes absorbs heat from the earth, returns it to a heat exchanger where the heat is transferred from the liquid to air and blown into the school. Cold liquid exits the system and is reheated as it circulates through the buried pipe and then returns to the building. In the summer, the system is reversed, and the unit pulls heat energy from the building and moves it to the ground. This technology is well developed. These systems are currently in operation in the Bloomfield region and in public and private facilities throughout the country.

Administration:

The district has received bids from local and regional contractors to install a complete system. The District owns the land necessary to install the ground loops. The project will take approximately eight working days to complete the installation.

Financial Assessment:

The total cost of the project is \$20,875. DNRC grant funding of \$18,375 amounts to 88 percent of the project costs with the remainder made up through a \$2,000 contribution by the local electrical utility and \$500 match from the project sponsor. Grant funding is made up of \$14,750 for construction, \$1,000 for the purchase of an extended warranty, \$1,750 for contingency, and \$850 for administration.

A cost/benefit of the geo-source heat pump was calculated by comparing the life-cycle costs of this alternative with the life-cycle costs of a high-efficiency propane system with a 20-year useful life.

A present worth analysis comparing the geo-source system and a high-efficiency propane system over 20 years yields the following conclusions:

- Based on quotes from local contractors, the geo-source system will require a capital investment of \$16,750, and an annual investment of \$845 for operation and maintenance (275 days a year). At 4.6 percent interest over 20 years, this alternative yields a present worth of \$27,647.
- A high-efficiency propane system will require a capital investment of \$15,550, and an annual investment of \$1,915 for operation and maintenance (275 days a year). At an interest rate of 4.6 percent over 20 years, this alternative yields a present worth of \$40,246.
- A comparison of these two systems favors the geo-source system with a savings of \$12,599 over the 20-year term of the investment.

Benefit Assessment:

Installation of the geo-source system will result in direct energy savings of approximately 45 percent over a high-efficiency propane system. This system can remain in the basement of the school and will not take up valuable space in a two-room schoolhouse. Additionally, this project could serve as a valuable educational resource for both students and the local community by promoting the use of renewable resources through the use of new technology in traditional applications.

The Bloomfield School serves 25 students in grades K through 8. The building also serves as the community center for the town of Bloomfield and is utilized by a variety of local and regional organizations for monthly meetings and workshops. The school is available for board-approved private functions at no cost to the user. The school serves as the polling place for local, state, and national elections. This project has wide public support and could potentially benefit all of the members of the community of Bloomfield as well as individuals that live in the surrounding area.

Environmental Evaluation:

There are no long- or short-term adverse environmental impacts associated with this project.

Recommendation:

Due to a clerical error in the project application, DNRC recommends grant funding of \$18,375. The applicant mistakenly failed to include the contribution of the project sponsor in the budget calculations. Therefore, the amount requested for grant funding is reduced by \$500 to reflect this correction.

Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a project budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 17

Applicant Name: City of Choteau
Project Name: City of Choteau Rehabilitation of Sewer System

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 100,000	TSEP Grant
	\$ 200,000	Local Revenue Bond
Estimated Total Project Cost:	\$ 400,000	
Amount Recommended	\$ 100,000	

Project Abstract: (Prepared and submitted by the applicant)

The City of Choteau's grant will be used for the first phase of an extensive upgrade to its wastewater facilities.

Sewer service is provided by a city-wide collection system that drains southerly to a large, single-cell wastewater stabilization pond. During the summer, after natural biological treatment, effluent is discharged to nearby alfalfa fields for land application. In the winter the effluent is discharged into the Teton River.

Typical of many small rural Montana communities, the wastewater collection and treatment facilities are old and are experiencing operational problems. In particular, there is a severe problem with shallow groundwater infiltrating into the wastewater collection system, which frequently exceeds the collection system's capacity. This results in a severe surcharging of the sewer system. Excess waters mixed with raw sewerage, have backed up into basements of the nursing home, businesses, and even bubbled out manhole covers and found its way into the city's storm sewers. Although the treatment facility provides a degree of biological treatment, the excess waters create operational difficulties and make it extremely difficult to meet the increasingly more stringent regulations regarding the quality of treatment of effluent discharges.

This phase concentrates primarily on improvements to the city's collection system. The existing system will be rehabilitated by using television inspection to identify pipe joints that need resealing by grouting. An apparatus is introduced into the system at manholes which is then pulled down the line allowing television inspection of the joints and

pipeline conditions. The television inspection should also reveal areas where poor service connections, broken or cracked pipe, or other pipeline deficiencies are allowing groundwater to enter.

These efforts will be coupled with spot excavating and repairing found or known major points of groundwater infiltration into the collection system.

Technical Assessment:

Background:

The City of Choteau is currently experiencing operation problems with its aging wastewater collection and treatment facilities. The city's wastewater facilities serve a population of 1,780, which consists of 1,008 residential and commercial hookups. The collection system is experiencing severe infiltration as a result of high groundwater throughout the area. At times the infiltration is such that the system's capacity is exceeded. The excess waters entering the wastewater lagoons create operational and treatment difficulties.

Approach:

The city is proposing two phases for solving the wastewater problems. Phase I will address collection system deficiencies (severe infiltration) and phase II will address treatment facility problems. The funding requested by the applicant for this project is for phase I improvements only. The existing sewer collection lines will be television inspected to identify leaking joints, broken pipe, poor service connections or other pipeline deficiencies. Leaking joints will be sealed using a pressure grouting process. Major pipe deficiencies will be addressed by spot excavation and repair.

A draft wastewater facility plan has been prepared by the applicant. The plan has not yet been approved by DEQ. The technical documentation is sound and the proposed phase I improvements appear to represent the most efficient, appropriate, and cost-effective alternative for resolving the severe infiltration problem. Phasing the project makes good sense. Once the infiltration is stabilized, a design flow may be determined. Design of a new treatment facility can then be based on a lower incoming flow and correspondingly reduced capital costs.

Administration:

The treatment facility is currently facing some compliance issues. Phase I improvements are the first step in addressing these issues. The budget and cost estimates are reasonable for a project of this scope. The time line set forth in the facility plan is not feasible if DNRC and TSEP funds are to be utilized.

Financial Assessment;

The proposed funding strategy for the \$400,000 project consists of a \$100,000 DNRC grant, a \$100,000 TSEP Grant (1996 application has been made), and a \$200,000 local revenue bond. The project budget includes \$16,000 for administration, \$46,000 (\$13,000 DNRC) for engineering, \$308,000 (\$87,000 DNRC) for construction, and \$30,000 for contingency.

The applicant states the rates will increase from \$6.61 to \$8.43 per month with funding assistance from DNRC and TSEP. Without the \$200,000 grant money the average monthly rate will be \$10.25. The city anticipates rates around \$14.38 when both phases are complete.

The estimated costs and project budget appear reasonable. The project is financially feasible.

Benefit Assessment:

Potential beneficial impacts may be realized by improved surface and groundwater quality from decreased exfiltration, improved public health and safety due to decreased sewer backups, and improved wastewater collection. Implementation of the improvements proposed by the city is the first step in bringing the wastewater system into compliance with standards.

Public support from local organizations is documented. The entire community will realize a benefit to public health by reducing leaking and surcharging from existing sewer mains.

The project supports the State Water Plan through improvements in water use and conveyance efficiencies and conservation of groundwater quantity. Project will result in preventing sewage from entering the aquifer (exfiltration), and will prevent unnecessary contamination of the Teton River by decreasing the amount of discharge during winter. The project will improve irrigation efficiency if wastewater irrigation continues.

Environmental Evaluation:

Implementation of the project is not expected to result in any long-term adverse impacts. The only adverse impacts expected are temporary disruption of air quality and noise during construction.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Since significant analysis remains to be completed on the community’s wastewater treatment facility, it is recommended that grant monies be restricted to collection system improvements only, Phase 1. Original plans and specifications shall be submitted to and approved by DEQ prior to construction.

Project No. 18

Applicant Name: Yellowstone County
Project Name: Conservation Resource Inventory

Amount Requested:	\$ 29,250	Grant
Other Funding Sources:	\$ 17,000	Project Sponsor
	\$ 7,000	City of Billings
Estimated Total Project Cost:	\$ 53,250	
Amount Recommended	\$ 29,250	

Project Abstract: (Prepared and submitted by applicant.)

Yellowstone County is proposing to conduct an inventory that will help resource planners and managers protect natural and cultural resources. Collectively these resources are called conservation resources. The results of this inventory will be a series of electronically reproducible and upgradeable maps, generated by the Yellowstone County GIS Department and accessible to the public. The inventory will identify the location, extent, and character of: groundwater and surface water resources, floodplains, wetlands, wildlife habitat, prime agricultural soils, geologically hazardous areas, recreation areas, and scenic, historical, archeological, and cultural resources.

The Billings Urban Planning Area is experiencing significant growth and is constantly pressured to provide for more public services while promoting orderly development. Decision makers rely on the Yellowstone County Comprehensive Plan and similar documents for an understanding of public needs and desires. Development often conflicts with planning policies that seek to manage, protect, and preserve natural and cultural resources. These resources are not mapped for the Billings Urban Planning Area. The proposed inventory will help decision makers reduce or eliminate the adverse effects of development on conservation resources.

A natural resource planner will be contracted to collect and synthesize data from existing maps and published literature, aerial photographs and field mapping. City/county planners will assist with the data collection phase. The data will be entered and digitized into the county GIS, ArcInfo, by a county GIS specialist and analyst. The total cost of the project is \$53,250.00. This Renewable Resource Grant will provide 55 percent of the total project costs. The remaining costs will be covered by in-kind contributions from the Billings City/County Planning Department and the Yellowstone County GIS Department.

Technical Assessment:

Background:

The goal of this project is to provide adequate information that may be used in the process of planning urban development to ensure that natural resources are managed according to the interest for their protection. The final result will be GIS mapping capability that will be available to planners working toward favorable developments in the Billings Urban Planning Area. The GIS services resulting from this project may provide information that is useful to other professionals in the public and private sectors as well.

Approach:

The project proposes to compile and map data for the Billings Urban Planning Area. Data will be gathered for groundwater, surface water, flood plain, wetland, wildlife habitat, geologically hazardous, recreation, scenic, historical, cultural, and archeological areas. Areas of prime agricultural soils will also be mapped. No alternative to the GIS approach was discussed; there really isn't another way to accomplish the proposed objectives.

This project is a demonstration of the application of GIS to community planning in Montana. It is not clear whether it will result in significant impacts on the planning process. It is clear, however, that access to this information will offer the planning community the resources necessary to prevent poor planning decisions.

This application provides adequate technical documentation, except that sources of data were not specified. It is not possible to determine to what extent the consultant will exhaust possible sources of data for the GIS. This factor may ultimately determine the merits of the resulting product.

Administration:

Mapping capability generated through this proposal should be provided to Montana Natural Resource Information Service (NRIS). Some provision to ensure that available data are gathered proficiently should be negotiated in the contracting process. It should not be left entirely to the selected consultant to determine which resources will be used to gather information. Therefore, additional coordination to acquire data will be necessary.

There are no legal hurdles associated with the project. However, the project sponsor will need to resolve the issue of ownership of data and whether fees may be charged for use.

Financial Assessment:

The total project cost is \$53,250. The requested grant funding of \$29,250 is comprised of \$24,000 in professional costs, \$3,000 for technical, and \$2,250 for administration. The project sponsor will provide \$17,000 in match funding and the City of Billings will provide an additional \$7,000. The project budget should be accepted as proposed.

Reviewers were concerned that the source of funding for ongoing maintenance of the data would be fees to users. The suitability of charging fees for data developed with state funds was questioned. Requiring the county to fund the operation and maintenance associated with the data when users statewide could access the information may not be an appropriate requirement.

Benefit Assessment:

The proposal provides evidence that resource planning is a priority in the community and has been a topic of planning documents for several decades. Grant funding will provide GIS planning tools that may in the future help the county make better resource development decisions. This project will help the county avoid planning urban developments in areas that would be negatively impacted. However, the project itself, is devoted to data collection and will not result in any changes to the use of existing resources.

Environmental Evaluation:

No direct environmental impacts will result from project implementation.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$29,250. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. It may be necessary to condition funding on the development of a budget for the ongoing maintenance of the data collected for this project. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 19

Applicant Name: Glasgow Irrigation District
Project Name: Vandalia Diversion Dam - Rehabilitation Plan Study

Amount Requested: \$ 98,221 Grant

Other Funding Sources: \$ Unknown In-kind Contribution by Glasgow Irrigation District

Estimated Total Project Cost: \$ 98,221

Amount Recommended: \$ 98,221

Project Abstract: (Prepared and submitted by applicant.)

This grant application is for an engineering study to repair Vandalia Diversion Dam. Constructed from 1915-1917, Vandalia Diversion Dam diverts water from the Milk River for the Glasgow Irrigation District. After 80 years of operation, the facility is in need of significant repairs, rehabilitation, or replacement. The study will identify structural deterioration, categorize and prioritize repair alternatives, and estimate costs for rehabilitation.

The District includes 106 operational farm units covering more than 18,000 acres. A rural population of approximately 591 people rely on project facilities for irrigation water and numerous others use the reservoir created by the dam for irrigation pumping. The project facilities are the economic backbone of the agricultural community. The reliability of Vandalia Diversion Dam is key to the economic stability of Glasgow and Nashua.

Glasgow Irrigation District has aggressively been working toward modernization, rehabilitation, and repair of the project facilities. The district recently completed a \$2.2 million federal R&B loan project to repair and modernize the main conveyance system. Also, a cost-share grant with DNRC was used to replace 128 of 300 farm delivery structures. These loan and cost-share projects have caused a financial strain on the district. The district is beyond its maximum ability for repayment through the R&B loan program, which has resulted in a reduced annual economic return to irrigators. Although the district may be able to pursue other grants or Pick-Sloan funds for future repairs, no such funding sources are currently available for this study.

The need for analyzing cost-effective repair alternatives is immediate. The structural integrity of the dam is vital to delivery of water. Delays will increase the costs of repairing the dam and could ultimately lead to failure of the structure.

Technical Assessment:

Background:

Vandalia Diversion Dam is located on the Milk River approximately three miles west of Vandalia, Montana. The diversion dam was constructed in 1917 as part of the Glasgow Division of USBR's Milk River Project. The diversion dam is a reinforced concrete slab and buttress structure with a gated overflow crest. Water is diverted into the Vandalia South Canal through four inlet gates incorporated into the right (south) end of the dam. While the dam has received regular maintenance over the 80 years since its construction, the dam is now in need of major rehabilitation or reconstruction to maintain its ability to control flow and divert water in a safe and effective manner.

Approach:

The proposed project consists of completing a rehabilitation plan study for the Vandalia Diversion Dam. The study will identify structural and mechanical deterioration, categorize and prioritize repair alternatives, and develop costs estimates for repair alternatives. The study will also include the development of a total replacement alternative to help determine if rehabilitation of the existing dam is cost effective. The study will include (1) a record search and evaluation; (2) field investigations including concrete condition survey, bridge corrosion survey, and related topographic survey; (3) coordination with Glasgow Irrigation District and USBR personnel; (4) development and evaluation of repair or replacement alternatives; (5) formulation of a recommended rehabilitation program; (6) an environmental survey; and (7) preparation of a final report.

Administration:

The Glasgow Irrigation District will administrate the proposed project. The rehabilitation study will be completed by a private consulting engineering firm. A coordination meeting will be held with USBR to solicit input as to the direction and progress of the study. Work is scheduled to commence before September 1997 and is expected to be completed by May 1998.

Financial Assessment:

The proposed project's total cost is \$98,221. However, this cost does not include unvalued in-kind contributions by the Glasgow Irrigation District including project management and administration and other miscellaneous expenses.

The grant request of \$98,221 is comprised of \$88,754 for professional labor costs, \$4,790 for associated technical, and travel expense, and a 5 percent inflation factor of \$4,677 is also included in the budget.

A farm budget analysis completed in 1987 for the irrigation district concluded that no repayment capacity was available to fund work such as the proposed project. However, a USBR *Review of Operation and Maintenance Program* for the Glasgow Irrigation District completed in 1991, states that the Glasgow Irrigation District had at that time about \$152,000 in a reserve fund. This amount of reserve funds is at the high end of USBR's recommended levels. Information was not provided as to the amount of reserve funds available at this time.

Benefit Assessment:

Approximately 600 people living on 106 operational farm units rely on the Vandalia Diversion Dam to provide irrigation water. There are additional farms that pump irrigation water from the reservoir pool formed by the diversion dam. The economies of local communities, including Glasgow and Nashua, are heavily dependent upon irrigated farmland maintained by the diversion dam.

Successful rehabilitation or replacement of the Vandalia Diversion Dam will help conserve, manage, and protect the water resources of the Milk River basin. If the project is not completed, the potential for failure or loss of use of the diversion dam will increase. If the dam failed or became unusable, significant adverse impacts to the local farmers and communities would occur.

This project implements the policy objectives of the State Water Plan through the improvement of existing water storage facilities, and the improvement of the efficiency of existing irrigation systems.

Environmental Evaluation:

It was determined that no adverse environmental impacts would result from activities associated with this proposed project. This determination was made based on the fact that the project consist of an engineering study and does not include any activities that would result in any impact to the environment. The study will include an environmental survey that will identify any environmental issues resulting from the implementation of the study recommendations.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$98,221. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

The rehabilitation study must address the need to upgrade the design of the diversion dam, as recommended in USBR's *1981 Safety Evaluation of Existing Dams Report*. Updated hydrologic, geotechnical, and structural analysis needs to be completed to assure that the recommended rehabilitation program will bring the diversion dam into compliance with all current standards. The environmental survey must include input from DFWP, especially as to the impact of the dam on fishery resources.

Project No. 20

Applicant Name: Roosevelt County Conservation District

Project Name: Fort Peck Assiniboine and Sioux Municipal, Rural, & Industrial Water Project

Amount Requested: \$ 64,561 DNRC Grant

Other Funding Sources: None

Estimated Total Project Cost: \$ 64,561

Amount Recommended: \$ 64,561

Project Abstract: (Prepared and submitted by applicant.)

Roosevelt County Conservation District is proposing to conduct a needs assessment and feasibility study for planning, design, construction, operation, maintenance, and replacement costs of a regional community, rural, and industrial water project. This system would be interconnected with the Fort Peck Assiniboine and Sioux Rural Water Project, which is proposed for authorization by the United States Congress. This project will provide for the enlargement of the intake, treatment plant, pipelines, pumping stations, and related facilities to deliver water off of the Fort Peck Indian Reservation to surrounding communities, rural residences, and pasture taps for livestock. The authorizing legislation will provide federal funds for 75 percent of the off-reservation planning, design, and construction in addition to funding for enlargement of facilities on the reservation. Twenty-five percent of the project funding will come from state and local water user funds.

To implement the construction it is necessary to perform a needs assessment and feasibility study of the Fort Peck Assiniboiné and Sioux Municipal and Rural Water Supply System. The off-reservation needs assessment and feasibility analysis would be completed from the project proposed here. The needs assessment will identify the amount of water required and the communities and rural areas to be served by the project in northeastern Montana. Water supply needs for in-house, lawns, and gardens, commercial, livestock, fire, and other purposes will be evaluated keeping in mind water conservation practices and codes. This study will also assess the need for the upgrade of existing water distribution facilities in the communities and rural areas. The feasibility study will determine the construction costs of new pipelines, pumping stations, reservoirs, and related facilities to distribute water throughout the area. Annual operation, maintenance, and debt service costs will also be evaluated for alternative cost-sharing scenarios.

Technical Assessment:

Background:

The Fort Peck Indian Reservation is located in northeastern Montana and includes large parts of Roosevelt and Valley counties and smaller areas of Daniels and Sheridan counties. The reservation is home to the Assiniboiné and Sioux tribes. Groundwater from shallow alluvial aquifers is the primary water source for water systems located on the reservation. Water quality on the reservation is generally of marginal quality. Microbiological as well as chemical and excessive heavy metal concentrations are the primary contaminants.

Off reservation communities to the north and east of tribal lands share these water quality problems. USBR has spent \$350,000 since 1993 to conduct an on-reservation needs assessment and feasibility study. The needs of off-reservation communities were accounted for by over sizing transmission lines, pumping stations, and associated facilities. USBR did not have the funding to work directly with the off-reservation communities to identify current and future needs. Funding is needed to develop engineering designs to connect these communities to the proposed tribal system and to address local infrastructure needs. This application would provide funding to conduct a needs assessment and feasibility analysis for the off-reservation portion of the proposed regional water system.

Approach:

The applicant would conduct an off-reservation needs assessment and feasibility study of a proposed regional water system. The focus of the study will be to initiate public involvement and collect data on existing usage and systems. This information is necessary to support the feasibility of expanding the on-reservation system to include the adjacent population. It is estimated that approximately 600 rural connections as well as 20 small communities could benefit from the regional system. If feasible, the applicant would join the tribe in seeking federal funds to construct this regional system.

The applicant proposes to employ a half-time staff person to coordinate public meetings, meet with city officials, and collect data necessary to produce a needs assessment and feasibility report. The staff person will also be responsible for coordination with the Fort Peck tribes and will work closely with the tribes' engineer

Administration:

Project administration will be performed primarily by a staff person employed by the Roosevelt County Conservation District. The schedule proposes five months to conduct the needs assessment and feasibility study. The newly created staff position would be funded half-time for one year.

Financial Assessment:

Federal funds were used to collect on-reservation data necessary for a needs assessment and feasibility report. An additional \$210,000 has been requested for the federal fiscal year 1997. These funds will be used to conduct final planning studies of the project within the Fort Peck Indian Reservation and to incorporate the analysis funded by this grant for off-reservation needs.

The funds requested in this application will be used to coordinate public involvement and collect information for the evaluation of off-reservation needs. The hourly rates and time estimates stated in the budget are reasonable for the scope of work being proposed. The applicant has not requested funding from sources other than the Renewable Resource Grant and Loan Program. The proposed effort to collect and evaluate data for off-reservation involvement in the regional system is financially feasible.

Benefit Assessment:

The public benefits of a regional water system in northeastern Montana are clear. Current water supplies are limited and of marginal quality, although there are no existing known health violations. The long-term prognosis is for limited growth in the area. However, there is the potential for industrial growth both on and adjacent to the reservation, and it is estimated that 50,000 head of cattle and 600 farms and ranches would benefit from development of a regional water system.

This project implements the policy objectives of the State Water Plan through development of the uses of Missouri River water without adverse impact. The project would improve water use and conveyance efficiencies of municipal systems.

Environmental Evaluation:

Potential adverse environmental impacts resulting from construction of the regional water system are unknown. Potential negative impacts include the diversion of surface waters from the Missouri River and the construction of a network of pipelines across 2.6 million acres in northeastern Montana. Short-term construction impacts would be unavoidable.

Recommendation:

DNRC recommends grant funding of \$64,561, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, staffing, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 21

Applicant Name: Choteau County
Project Name: Highwood Water and Wastewater System Improvements

Amount Requested:	\$ 80,000	Grant
	\$ 106,321	Loan
Other Funding Sources:	\$ 400,000	CDBG grant
	\$ 420,000	TSEP grant
	\$ 40,000	MDOT
	\$ 326,792	SRF Loan
	\$ 90,008	District

Estimated Total Project Cost: \$1,463,121

Amount Recommended:	\$ 100,000	Grant
	\$ 106,321	Loan

Project Abstract: (Prepared and submitted by applicant.)

Chouteau County has prioritized Highway 228, a gravel road serving Highwood, for major improvements in 1997. An unincorporated community, Highwood is served by a water users association and a sewer improvement district. Both entities need to upgrade their systems; the water distribution lines may be replaced before the highway construction is completed. At the request of the Highwood Improvement Association, the county amended its engineering contract to include an analysis of the community's water and sewer system.

Highwood's sewer treatment plant is in poor condition and has reached the end of its design life. The plant violates its permit conditions several times each month and is presently achieving only 30 to 60 percent of required treatment levels. The lack of standby power creates potential for backup and overflow. Also, the high operation and maintenance costs of this mechanical treatment process are difficult to fund in a small rural community.

The community's water supply is adequate, but the chlorination system needs improvement in order to provide adequate contact time and reduce contamination potential. During high demand periods, water is pumped directly into the distribution system due to a lack of storage capacity. This creates low pressures, resulting in backflow and possible contamination. The distribution system is 50 years old and several mainlines dead-end. These pipes tend to collect sediment, allowing water to become stagnant. Dead-ends also require widespread shut-offs in the event of a break in a main line. Many service lines are lead, also creating a potential health problem. Test results show concentrations of lead above the recommended levels.

The existing water association and sewer district have agreed to merge, creating a unified Highwood Water and Sewer District, which will be responsible for operating and maintaining the improved systems.

Technical Assessment:

Background:

The existing mechanical wastewater treatment plant in Highwood is difficult to operate, at the end of its design life, and

frequently violates its DEQ discharge permit. A small community like Highwood generally cannot afford to obtain the technical expertise to operate a plant of this complexity. Efforts to improve operation of the system have not been successful.

The water system is undersized and lacks existing capacity to provide fire protection. The chlorination system does not provide adequate disinfection, and lead service lines have resulted in high concentrations of lead in the water supply. Highway work in the area has resulted in the need to replace lines prior to laying new asphalt.

Background:

This project entails the construction of major water and wastewater improvements for the community of Highwood. Total replacement of the existing mechanical wastewater plant with a lagoon system is proposed. Discharge will be to either Highwood Creek or agricultural lands. The proposed system will provide cost-effective and much simpler improvements needed to replace the existing system. Seasonal irrigation of treated wastewater could significantly improve water quality in the existing receiving stream.

The water improvements include the replacement of the existing distribution system (including service lines), a new storage tank and improved chlorine disinfection. The improvements allow for adequate flows for fire protection, improved system pressures, better disinfection, and the elimination of lead service lines. These improvements are necessary to ensure a safe and adequate water system. Further analysis of the source of drinking water would be beneficial.

Administration:

This project involves a complex funding strategy to ensure that the project remains viable. Administration of the financial assistance programs is provided by a project management firm. The funding schedule provided in the engineering report is not feasible. Land has not yet been acquired for the new treatment lagoons and irrigation system. Budget for the project is adequate but allows little room for contingencies.

Financial Assessment:

The revised wastewater engineering report shows user costs at \$71.26 per month for water and sewer rates with construction of the new projects. This amount is \$51.26 above existing rates and well above the target user rate of \$32.37 per month. These high rates are dependent on assistance from a number of different financial assistance programs. Budget revisions have been made to the TSEP grant application and provided to this program which show rate increases of \$40.00 per month. These revisions do not agree with the revised facilities plan, yet they continue to indicate that project costs are high.

Project feasibility is marginal until the financial strategy has been adequately considered and the revised costs provided to the public. Assuming revenue bonds will be issued by the Highwood Water and Sewer District (if and when formed), a local election will be necessary to approve the debt. Assigning priorities to the needed project and reducing project scope to lower user costs may be of value in gaining public acceptability. Funding differences between the financial strategy and the engineering report should be reconciled.

Benefit Assessment:

This project will conserve and protect Montana's water resources. Conservation is provided by the use of water meters on the water distribution system improvements and the installation of new pipe which reduce losses by leakage. Conservation will also be provided by the wastewater improvements in that treated effluent will be irrigated, thereby

conserving other sources of water that would otherwise be used. Protection of water quality in Highwood creek will also be a benefit of this project. The seasonal irrigation of the treated sewage in lieu of a discharge to the creek is being proposed to protect water quality from bacteria and toxicity caused by ammonia.

This project implements the policy objectives of the State Water Plan through water conservation and improvements in water quality protection resulting from the reduction of contaminants discharged to Highwood creek.

Environmental Evaluation:

No long-term adverse environmental impacts are anticipated as a result of this project. Short-term environmental impacts related to construction of new infrastructure such as dust, noise, runoff, etc. will occur but can be controlled through mitigative measures imposed upon the construction contractor.

Recommendation:

Due to the high project costs and the high burden the community will take on as a result of this project, DNRC recommends increasing grant funding from the \$80,000 requested to \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Funding for this project is contingent upon the following: DEQ review of preliminary engineering report and design; revision of the financial strategy and elimination of inconsistencies in user costs; creation of a County Water and Sewer District; and public input of revised project scope and costs.

Project No. 22

Applicant Name: Pondera Conservation District
Project Name: Lake Frances Shoreline Rehabilitation Project

Amount Requested:	\$ 20,000	Grant
Other Funding Sources:	\$ 1,500	Project Sponsor
	\$ 2,500	DFWP - Future Fisheries Grant
	\$ 7,500	Motor Boat Access Funding
	\$ 10,000	Fish America Foundation
	\$ 30,110	Private Donations
	\$ 11,500	Natural Resource Conservation Service
	\$ 10,000	Pondera County Canal & Reservoir Company
Estimated Total Project Cost:	\$ 93,110	
Amount Recommended:	\$ 20,000	

Project Abstract: (Prepared and submitted by applicant.)

Lake Frances has 6,000 surface acres and stores 105,000 acre-feet of water at full pool. Wave action, due to high winds, has caused severe erosion to the lake shore. Using GIS digitizing, it is estimated that more than 100 acres of surface area have been lost to erosion since 1941. This equates to an average of 16,378 tons of soil lost per year.

This erosion is degrading water quality for recreation, fisheries, and drinking water; destroying the trees and riparian habitat along the Lake Frances campground; and adversely affecting the recreational use of the Lake Frances campground and the economy of Valier.

Project objectives are to reduce the impact of wave action and decrease erosion; improve the quality of water by decreasing sedimentation; restore lost riparian habitat and prevent further destruction; and restore the integrity of the campground and improve recreational opportunities.

Of a variety of alternatives developed, the most cost-effective and aesthetic choice is to construct a wooden bulkhead along 1,200 feet of the critically eroding lake shore. Trees, grass, and shrubs conducive to erosion control, wildlife habitat, and recreation will be planted to complement the bulkhead.

Technical Assessment:

Background:

Wave action due to high winds is causing severe erosion along approximately 3,000 feet of shoreline. The damage from wave action is currently accelerating with the loss of riparian vegetation that previously helped to dampen the effects of wave action. The most serious impacts are loss of land, increased sedimentation of a water body that is Conrad's sole source of drinking water, and the eventual inundation of the Lake Francis Recreation Area. The local community has unsuccessfully attempted to reduce erosion through the deposition of riprap along the shoreline. Due to the shallow inclination of the shoreline, this alternative would require the construction of a high berm that would prove both unsightly and unsafe for recreational users.

Approach:

Project design was completed by NRCS. Six alternatives were considered. The preferred alternative, presented in this application, is to construct a wooden bulkhead along 1,200 feet of shoreline to dampen the wave action that is severely eroding the shoreline. This design was chosen on the basis of cost efficiency, aesthetics, and safety for recreational users.

Final project design will be reviewed and approved by the NRCS state office. The useful life of the project is approximately 20 years.

Administration:

This project will be administered jointly through the Pondera County Conservation District and the local NRCS office. This project will require a 404 permit from the U.S. Army Corps of Engineers pursuant to the Clean Water Act. A permit for this kind of activity is standard and should not unnecessarily delay project implementation. Construction would commence after the irrigation season in November of 1997 and will be completed by June of 1998.

The dam and the impoundment is owned by the Pondera Canal and Reservoir Company. If the Pondera Canal Company were to increase the lake level to the maximum pool level, the entire recreation area would be inundated. Irrigation is the primary use of Lake Francis, and the canal company is very reluctant to formally adopt measures that might limit options

for the sake of recreation benefits.

The recreation area is owned by the Pondera Canal and Reservoir Company and leased to the city free of charge for a term of 25 years. This lease was renewed on May 3, 1996, with an option to renew again in May 2021.

Financial Assessment:

Total project cost is currently estimated at \$93,110. DNRC grant funding of \$20,000 amounts to 21 percent of the total project costs with the remaining 79 percent secured through a variety of sources. Of the \$20,000 requested, \$18,000 will go to the purchase of materials and \$2,000 will be used to cover the cost of administering the project.

The City of Valier has initiated a "Save Our Shoreline" campaign to raise \$30,000 in private contributions. As of August 1996, they had raised \$8,500 in private contributions. The Pondera Canal and Reservoir Company, the landowner, will provide \$10,000 in match funding for materials and labor. NRCS will provide \$11,500 in technical assistance and administrative services. The project sponsor will provide \$1,500 of in-kind service, and the remaining \$20,000 will be funded through a variety of grant programs.

The construction contract for materials and labor amounts to \$58,110. Without grant funding, the project sponsor will scale back the project to include only the most critical 600 feet of the bulkhead. The sponsor could construct 600 feet for approximately \$33,000, of which \$21,000 is currently in-hand.

Benefit Assessment:

This project has quantifiable public benefits through improvements to water quality through reduced sedimentation, the preservation of land resources that are currently being lost to severe erosion, increased recreational opportunities as a result of improvements to the recreational area, and economic benefits for the local community that provides goods and services to recreationists. The degree of erosion is accelerating with the ongoing destruction of additional riparian habitat and recreational resources. Implementation of the project will result in immediate quantifiable benefits to the public and to land and water resources.

Although the project will improve privately owned lands, the local community is the primary beneficiary through improvements in land, water, and recreational resources.

This project implements the policy objectives of the State Water Plan through rehabilitation of a water storage facility with multiple public uses, and mitigation of a non-point source water quality problem through voluntary action. Lake Francis is listed in the 1988 non-point source report as impaired from sedimentation, nutrient loading, and bacteria. This project is designed to rehabilitate an erosion problem of a water storage facility. The project will improve resource-based recreation, improve water quality, and restore the riparian zone.

Environmental Evaluation:

Any adverse environmental impacts resulting from project implementation are short term and minimal. Construction of the bulkhead will require some dredging of material from the lake bed for use as backfill. This disturbance will result in temporary increases in sedimentation as a result of wave action. There is good access to the area, and trampling of riparian habitat will be negligible or non-existent.

Recommendation:

DNRC recommends grant funding the total amount requested, \$20,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured.

The project sponsor shall secure all of the necessary permits pursuant to state and federal law prior to commencing any construction activities. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 23

Applicant Name: City of Neihart
Project Name: Water Distribution Improvements

Amount Requested: \$ 100,000 DNRC Grant

Other Funding Sources: \$ 261,028 TSEP Grant

Estimated Total Project Cost: \$ 361,028

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The City of Neihart is proposing to install 6,150 feet of water main to replace a water main that was installed in 1892. Neihart has been under an almost continuous boil order from DEQ since 1980. In 1988, Neihart was issued a court order to provide safe water to its residents. Currently, groundwater and surface water are being contaminated by the release of chlorine treated water from the present system. This project is needed in conjunction with the current construction of a water treatment plant to bring Neihart into compliance with the court order.

Although a new treatment plant is being constructed, its operation is not feasible or affordable if the water mains are not replaced. Much of the water in the system is lost through leaks and wasting water to prevent freezing. Also, the lack of integrity in the old lines allows, at certain times, the suction of dirt and debris into the distribution system.

In 1892, the water mains were constructed primarily to provide water for electricity generation. Since water constantly moved through the generators, mains were buried only two to four feet in depth. Now to keep the mains from freezing, the town and residents release water from the system. All this adds up to large loss of treated water and contamination of ground and surface water.

Neihart has exhausted or is ineligible for almost no other funding. The town has borrowed to its legal limit of funds to construct the water treatment plant. The town has contracted to replace 1,000 feet of main that froze and broke this past winter. This effort will consume all funds the town can prudently expend on the water system.

Technical Assessment:

Background:

The City of Neihart was first issued a boil order and health advisory by the Montana Department of Health and Environmental Sciences in 1980. In 1989, a court order was issued along with compliance schedules that have not been met due to lack of feasible funding alternatives. To comply with the court order, Neihart applied for and was awarded a \$150,000 DNRC loan authorization and a \$544,644 TSEP grant by the 52nd Legislature. A project was designed to provide both a new treatment plant and a new water distribution system. The project was bid in 1995 with the result that the total available funding would cover only the cost of the treatment plant.

The existing distribution system was constructed in the 1890s at depths as shallow as two feet below the surface. As a result, the distribution lines are susceptible to freezing during cold weather unless water runs continuously through them. This is an unacceptable situation in that treatment costs are too high to allow treated water to be wasted. Furthermore, this practice allows chlorinated water to be discharged directly into Belt Creek during the winter months, resulting in adverse impacts to aquatic life.

The goal and objective of this project is to provide a municipal water system for the City of Neihart that complies with federal and state health requirements and also functions well from an economic and performance standpoint. Specifically, the distribution system upgrades will eliminate the loss of treated water through leakage, prevent the infiltration of untreated groundwater to the municipal water supply through infiltration, and will eliminate the system's susceptibility to freezing and associated negative economic and environmental impacts.

Options for Neihart are to proceed with small-scale repairs on an as-needed basis or to take no action and allow treated water to be wasted to prevent freezing during the winter.

Approach:

This project consists of the replacement and installation of 5,075 feet of 8-inch water main, 2,075 feet of 4-inch water main, new service connections with curb stops at the property line for 84 users, connections to existing mains, and new fire hydrants. Existing lines will either be abandoned in place or removed, depending upon location relative to the new lines. Construction of a main distribution system with a 6-foot minimum cover will eliminate freezing and subsequent broken lines during the winter.

A planned phase, not included with this project, will be the construction of individual service connections to replace existing shallow connections. This phase of construction will be the responsibility of each property owner, and may include the installation of water meters.

This project was designed in conjunction with the water treatment plant currently being constructed. It has been designed in accordance with DEQ (then Department of Health and Environmental Sciences) requirements, and received approval from that agency in 1995. Technical documentation is adequate and complete.

Administration:

The administration of this project will be performed by a resident project manager who will be a part-time employee of the City of Neihart. Technical inspection services will be performed by the engineer, a consultant also responsible for the design, advertising, and bidding processes.

The project is required to bring the City of Neihart's domestic water system into compliance with federal requirements as required by DEQ. Court orders were issued to the town in 1988 and 1989 requiring treatment of the water supply and improvements to the distribution system.

Construction is scheduled for late summer and early fall of 1997. Estimated project duration is 45 days. This is compatible with DNRC funding availability, but is dependent upon TSEP funding in the requested amount of \$261,028 for completion of the entire project.

Financial Assessment:

The City of Neihart is currently constructing a new water treatment plant as part of a project that originally included the distribution system improvements that comprise this project. Because bids for the project were higher than estimated, the DNRC loan and TSEP grant authorized by the Legislature in 1991, in conjunction with reserves supplied by the town, were enough only to cover the costs of the treatment plant. In addition, remaining reserves were used in 1996 to replace approximately 1,000 feet of water main that froze and broke due to shallow cover in the spring of that year, thus depleting Neihart's reserves even further. As a result, this project is totally dependent upon grant funding, (\$100,000 DNRC and \$261,028 TSEP), because the community has exhausted nearly all of its reserves. Both grants are necessary if the full scope of the project is to be completed. However, in the event Neihart does not receive both grants as requested, the nature of this project allows for critical sections of the system to be replaced and lowered on a section-by-section basis, thereby contributing to the correction of the overall problem.

The Neihart water system furnishes water to 84 users, about 60 of which are only seasonal users. The current monthly rate is \$30.00 per residential hook-up. There are no water meters.

Benefit Assessment:

The overall environmental impacts of this project are positive. The discharge of chlorinated water into the local aquifer and Belt Creek will be eliminated. Water usage will be greatly reduced through the replacement of leaky distribution lines and the elimination of the need to run the system continually to prevent freezing.

The project supports the State Water Plan by providing improved water-use conveyance efficiency and solving existing surface water waste and groundwater contamination problems. Additionally, the project will encourage economic expansion in Neihart by providing the community with a safe and reliable drinking water system.

Environmental Evaluation:

Adverse environmental impacts are short term and will include noise, dust, mud, and other undesirable but necessary impacts that are nearly always associated with construction activities.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. DNRC recommends full funding of this project irrespective of TSEP funding status.

All construction will be performed in strict accordance with DEQ approved plans and in compliance with state procurement statutes. The project sponsor shall secure all of the necessary permits pursuant to state and federal law prior to commencing any construction activities. The project sponsor shall implement all applicable Best Management Practices

in the design and construction/execution of this project.

Project No. 24

Applicant Name: Ruby Valley Conservation District
Project Name: Ruby River Water Management

Amount Requested: \$ 99,741 Grant

Other Funding Sources: \$ 25,861 Water Users
\$ 17,800 NRCS
\$ 2,175 Headwaters RC&D

Estimated Total Project Cost: \$ 145,577

Amount Recommended: \$ 99,741

Project Abstract: (Prepared and submitted by applicant.)

The Ruby Valley Conservation District is working with the Ruby River Water Users Association, the Ruby Decreed Water Users, and Ruby River Reservoir Task Force to ensure that the "Water Delivery and Dewatering Prevention Plan" developed for the Ruby River is implemented in a timely manner. This plan encourages the installation of adjustable headgates and measuring devices on all ditches originating at the Ruby River or Clear Creek, a channel of the Ruby River. Having both the adjustable headgates and measuring devices will assist the task force and Ruby Decreed Water Users in defining and maintaining adequate flow levels to satisfy senior water rights for irrigation while sustaining the fishery.

This project, which is classified as both a water management and conservation project, provides for the installation of 19 measuring devices and 8 adjustable headgates. Measuring and controlling the flow to the irrigation ditches will ensure the equitable and legal distribution of water, allow staggering irrigation diversion turnout dates to help alleviate water flow problems during peak demand, and conserve water by preventing seepage and deep percolation water losses in ditches when water is not needed for irrigation.

The 71 decreed water users on the Ruby River are the Montanans most directly benefitting from this project. However, all Montanans who use the Ruby River for agriculture, fishing, or other forms of recreation will benefit from this project through the conservation of water, improved water quality, and maintenance of sufficient instream flows to sustain the fishery.

Technical Assessment:

Background:

The Ruby River Reservoir was completely drained in September 1994. When this event occurred, a channel was eroded through the sediment at the bottom of the reservoir, and a large amount of sediment was suddenly discharged into the Ruby River below the reservoir outlet. This discharge of sediment resulted in one of the largest fish kills in Montana in the last 20 years. It is estimated that 10,000 to 15,000 fish died. Following this episode, a consent decree was issued describing the steps necessary to address the water quality violations that occurred. The installation of measuring devices within 5 years is one of those requirements. This proposal responds to that element of the consent decree.

Approach:

The goal of this project is to prevent dewatering of the Ruby River in order to protect fish habitat, avoid water quality violations, and to ensure that users with senior water rights have access to their rightful share of water. The plan for this project was developed in the Water Delivery and Dewatering Prevention Plan adopted by the Ruby River Task Force and the Ruby Decreed Water Users. This application will implement the plan through the installation of adjustable headgates and measuring devices to control water flows. Adjustable headgates will provide greater control over flow levels. Measuring devices will enable the water users to better determine the flows necessary to satisfy water rights while maintaining the fishery resources in the Ruby River.

The project will consist of the installation of 19 measuring devices and 8 adjustable headgates on 20 ditches between Ruby Dam and the confluence of the Ruby and Beaverhead rivers. The headgates and measuring devices will be designed by a technician employed by the project sponsor. All construction plans and specifications will be approved by the NRCS state office. The project sponsor will enter into agreements with individuals and groups to install specific structures. Upon completion, the structures will be owned and maintained by the individual landowners.

A related project, mentioned in the proposal, will seek funds to install diversion dams or rock sill structures in some ditches to ensure the effectiveness of the measuring devices. The cost of this phase is estimated at \$70,000. The project sponsor is currently seeking funds from DEQ through the 319 program; DFWP through the River Restoration Fund; and the Farm Service Agency. Since this phase is integral to the overall success of the project, the project sponsor must secure funding to construct these structures prior to entering into a grant agreement with DNRC to construct the headgates and measuring devices identified in this application.

The measuring devices specified in the proposal are Parshall flumes. The installation of short Parshall flumes may offer a cheaper and more effective alternative. There needs to be further investigation into the design of this component of the project. Project costs may vary depending on the appropriate construction option. Savings resulting from design changes could be applied toward the installation of the related diversion structures discussed above.

Administration:

Headwaters RC&D will provide project grant administration and financial reporting. The NRCS technician will review designs, oversee construction, and perform spot checks of the measuring devices installed. A part-time technician will complete the design work for the measuring devices and headgates. It is critical for cost containment and for successful installation that the designer have experience and knowledge of water measurement and design alternatives.

Financial Assessment:

Of the \$99,741 requested in grant funding, \$4,822 will be used for project administration; \$17,335 will be used for design and engineering; \$70,531 will go to construction costs; and \$7,053 is for contingency. The water users will contribute \$25,861 to construction costs in match funding and in-kind contributions. NRCS will contribute \$17,800 in professional and technical services; Headwaters RC&D will contribute \$2,175 to project administration. The estimated total project cost is \$145,577 to construct the adjustable headgates and measuring devices. The project sponsor still needs to secure approximately \$70,000 to complete the diversion dams identified in the application.

The project will be administered by Headwaters RC&D. This is a construction project and little administration is required except accounting of grant funds. Operators are required to match grant funds provided for the installation of headgates and measuring devices. Their match may include equipment and the cost of installation. Operators are required to contribute 25 percent of the total cost of these installations -- including labor and materials. Operator costs may be either

in-kind or cash.

Funding for the headgates and measuring devices would include grant funds, funds from Headwaters RC&D, in-kind support from NRCS, and in-kind and cash contributions from operators. Grant funds will be used to reimburse both material and labor costs; all matching contributions are secure with the exception of the actual participation of operators. The funds needed for related diversion structures have not been secured.

The project budget is well justified. The grant amount requested would be adequate to pay for the installation of the proposed headgates and measuring devices. Any excess grant funds could be contributed to the cost of the additional diversion structures.

Benefit Assessment:

The project would result in water savings and protection of water and fisheries resources. The dewatering of Ruby River Reservoir caused the largest fish kill in recent history. The proposed installation of measuring devices and headgates to control water flows will provide water users with greater water management capability. The application documents offer support from several organizations that have participated in developing a plan to avoid dewatering on the Ruby River. Support from local operators was not documented.

This project directly implements the policy objectives of the State Water Plan through support of ongoing watershed investigations that facilitate streamflow management plans in high-priority watersheds. The State Water Plan promotes installation of measuring devices to help resolve conflicts and improve distribution during drought.

Environmental Evaluation:

No significant long-term adverse environmental impacts will occur as a result of this project. The project sponsor will need to secure the necessary permits from the appropriate state and federal agencies prior to undertaking any construction activities.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$99,741. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, a project budget, and after all matching funds have been secured. The project sponsor must secure matching funds for construction of the diversion dams and rock sill diversions identified in the application prior to contracting.

The project sponsor must secure all of the necessary permits pursuant to state and federal law prior to commencing any construction activities. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 25

Applicant Name: Montana Department of Environmental Quality
Project Name: Waste Water Facility Planning Grants

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ None

Estimated Total Project Cost: \$ 100,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

DEQ has provided planning grants for water pollution control projects to small, needy Montana communities since 1985. These grants partially funded the facility plans that identify community water pollution control needs and options (such as water pollution control construction projects) to protect and enhance water quality. EPA's Federal Construction Grants Advance of Allowance Program annually awarded approximately \$75,000 to DEQ for planning grants. The facility plan costs are shared; 55 percent in grants and 45 percent in local funds.

The 1987 Federal Clean Water Act Amendments sunset the Federal Construction Grants Program and concurrently created the State Revolving Fund (SRF) Loan Program. EPA is phasing out the Construction Grants program and planning grant funds will no longer be available to DEQ. Montana communities now apply to the SRF program for low-interest loans to construct water pollution control projects, and while facility planning is required for infrastructure projects by virtually all grant and loan programs, SRF loan program rules do not allow funds to be used for facility planning grants.

This DNRC grant will help DEQ provide critical funding for Montana communities needing facility planning assistance, especially those: with facilities built in the 1970s and 1980s needing improvements, upgrading, and/or expansion (most exceed their 20-year design life); financing new systems to replace outdated, failing ones; and experiencing steady population growth, and having inadequately addressed infrastructure needs, i.e., wastewater treatment. Communities receiving financial assistance in the planning stage may more likely proceed to the construction phase and spur growth in the SRF loan program.

The DEQ biennial needs survey has identified \$80-\$100 million of needed wastewater projects in Montana. More than 75 percent of Montana's communities are small, having fewer than 10,000 people, and need assistance with their water pollution control projects. Planning grant funding assistance is critically necessary for the facility planning/construction grant and loan process for these small, needy Montana communities.

Technical Assessment:

Background:

Grant funds would be used to complete facility planning studies for Montana communities. The project would replace funding that, in the past, was available through EPA. Federal funds are no longer available for planning. EPA continues to subsidize loans for the construction of wastewater facilities, and experience shows that the better the quality of the

facilities plan, the better the success of the construction program. This proposal seeks to fund a well- established program. This project represents an ongoing effort and is only a substitution of state funds for federal funds that are no longer available.

A facility plan is the first step in the process to invest in water or wastewater infrastructure. The purpose of the study is to identify and analyze alternative options to meet community water and wastewater needs. Facility plans provide the basic information required by funding agencies when evaluating grants and loans.

Approach:

Because this proposal is a continuation of an existing program, there is a precedent that demonstrates that the project is viable and feasible. There are no legal hurdles associated with the proposal.

The applicant seeks to fund community facility plans for the next one to two years. There is no question that these funds will accomplish the stated objective.

Administration:

The grant will be administered by DEQ staff. Communities must apply to DEQ to receive this assistance. The format for planning studies has been approved by a statewide coordinating committee to ensure that studies provide the information needed to secure funding under a number of funding programs in the state.

The time line for the project is one to two years to distribute grant agreements and then one to two years for the completion of the study. On the basis of past experience, this time line appears reasonable.

Financial Assessment:

Funding is recommended for the project. This funding request will simply substitute state funds for federal funds. The applicant does not provide an assessment of the value of the in-kind salaries and facilities that will be provided.

The cost of a facility plan ranges from \$5,000 to \$20,000, depending on the complexity of the system. DEQ would fund up to 55 percent of this cost, so each community would receive between \$2,750 and \$11,000. A \$100,000 grant would fund approximately 10 to 20 facility plans. The community would cover the remaining 45 percent of the costs.

This grant will fund an ongoing program. DNRC and the legislature have discouraged ongoing grant funding to support state programs. The applicant is encouraged to seek a more reliable source of revenue for this purpose. It was mentioned

in the application that DEQ is considering options to use State Revolving Fund revenues or may implement a surcharge on loans for this purpose.

Benefit Assessment:

This project provides a funding source to complete facility plans, which may result in the construction of wastewater facilities that reduce impacts to surface and groundwater resources. Because these funds will be available to needy communities statewide, there will be considerable public benefit. While many communities qualify for construction assistance, the most needy communities are not likely to take the risk to fund a study with community funds when they are not sure that they will qualify for assistance. To some degree, the study helps them make that determination.

This project implements the policy objectives of the State Water Plan through the support of existing efforts to coordinate water management efforts among federal, state, and local government.

Environmental Evaluation:

No short or long-term adverse environmental impacts are associated with this project.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. DEQ shall expand the project scope to include planning grants for municipal drinking water projects. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 26

Applicant Name: Chouteau County and Fergus County
Project Name: PN Bridge and Campground - Streambank Erosion Control Project

Amount Requested:	\$ 76,450	Grant
Other Funding Sources:	\$ 4,075	Fergus County
	\$ 4,075	Chouteau County
	\$ 1,775	NRCS
	\$ 3,500	BLM
	\$ 1,500	Volunteer Labor

Estimated Total Project Cost: \$ 91,375

Amount Recommended: \$ 76,450

Project Abstract: (Prepared and submitted by applicant.)

This project would use riprap to stabilize approximately 500 linear feet of streambank along the north side of the Missouri River in Chouteau county upstream from the PN bridge (State Highway 236).

The PN Bridge connects Fergus and Chouteau counties about 20 miles northwest of Winifred and 45 miles southeast of Big Sandy on Highway 236. It is the only year-round link for commerce and agriculture to cross the Missouri River for 130 miles. Severe streambank erosion will, in time, threaten the north side bridge Approach. Damage is now occurring to an important campground located in an old, established cottonwood grove. Total documented use of the campground during the last five years was 6,854 people.

This proposal has broad public support. Inter-agency cooperation and long-term working relationships have been the mechanism by which the area has improved transportation and recreational values. There is a long history of discourse and participation between two counties, legislators, and two federal and five state agencies.

In 1995, the counties received an award notice of \$50,000 for their 1994 Renewable Resource grant application. (The original requested amount was \$99,615.) After careful review of all potential sources of revenue, the commissioners determined that project completion was not feasible with the limited funds and they had no other sources of revenue. Technical consultants felt that partial completion would involve considerably more expense and time involvement at a later date. Also, with the severe ice damage that occurred this winter, the urgency and need for the project was accelerated. Commissioners decided to push for expanded soft-match commitment from agencies and then to submit for additional grant money, based on more complete design plans and project schedules.

This project represents a classic opportunity for mitigation of loss. By using a well-established technique, non-renewable resources will be protected, renewable resources will be protected, and a structural improvement will be protected.

Technical Assessment:

Background:

The PN Bridge connects Fergus and Chouteau counties between Winifred and Big Sandy on Highway 236. It is the only year-round transportation link crossing the Missouri River for 130 miles. A public campground is located on the north side of the river immediately upstream from the bridge. The campground contains an established cottonwood grove, and has averaged in excess of 1,200 visits per year since 1991. Streambank erosion is occurring each year, causing the loss of valuable cottonwood trees and eventually threatening the north abutment of the bridge. Additionally, the erosion is creating an undercut bank at the campground, a condition which poses a safety threat to users of the facility.

In 1995, the Legislature awarded Chouteau and Fergus counties a \$50,000 DNRC grant. By combining the grant with local funding, the counties organized a project to riprap 300 feet of streambank. This project proposes to riprap an additional 500 feet of streambank. The objective is to armor the streambank and eliminate the erosion that occurs each year.

Approach:

This project consists of streambank preparation and the installation of clean rock riprap along the eroding river bank. Riprap would consist of large rock available from BLM located approximately 40 miles from the job site. This solution will protect the streambank from further deterioration without altering or affecting current patterns in the Missouri River. The project will result in the alleviation of head cutting at the PN Bridge and campground. An established cottonwood grove will be preserved, and possible scouring of the bridge's north abutment will be prevented.

In 1982, an investigation was conducted and recommendations were made by Dr. Donald Reichmuth, a geotechnical engineer. The report of that investigation discusses numerous options, including the construction of jetties to alter stream currents, the installation of rock "keys," the use of blanket riprap, and relocation of the mouth of the Judith River, which would also alter current patterns. Blanket riprap was chosen as the best alternative.

This report provides a good discussion of potential threats and solutions. With the exception of actually relocating the mouth of the Judith River, the alternatives discussed are all feasible and would probably be effective solutions. The chosen alternative is the most cost-effective method and will provide an acceptable solution to a problem that is recurring.

Administration:

As evidenced in the project budget, this project is receiving support from several agencies including BLM and NRCS. Additionally, both counties are contributing administrative support as well as labor and equipment. The first phase of

construction, being financed in part with a \$50,000 DNRC grant received in 1995, is scheduled for September 1996. The proposed project is scheduled for fall of 1997. This schedule is compatible with DNRC grant funding availability.

Financial Assessment:

Chouteau and Fergus counties are each contributing \$4,075 to this project, primarily in the form of construction labor and equipment. Additionally, Chouteau County has committed \$1,000 in administrative support to the project. Volunteer labor, engineering costs, and materials have been committed by local residents, NRCS, and BLM. The budget for the project includes a 10 percent construction contingency. Based upon a DNRC grant award and availability on July 1, 1997, the construction schedule is feasible.

The cost estimate and budget included in the application are complete. Quantities have been determined by NRCS, and a source of rock has been arranged with BLM. The estimated cost of \$25.00 per cubic yard to load, haul, and place riprap is historically consistent with similar projects.

Benefit Assessment:

This project will have positive environmental benefits for the Missouri River system, and potentially for its fisheries and wildlife. The cottonwood trees being preserved provide nesting habitat for large birds, including eagles. Water quality will be enhanced by reducing erosion, and the maintenance and preservation of the PN Campground will be an environmental asset to the State of Montana.

This project supports the policy objectives of the State Water Plan by mitigating an erosion and siltation problem and potentially improving water quality. Additionally, family-owned farms will benefit economically through maintenance of the PN Bridge. The PN Campground is a major landing for recreational users of the Missouri River in the area. Preservation of this site and the valuable cottonwood grove that grows there will benefit local residents and recreationists alike.

Environmental Evaluation:

No significant long-term adverse environmental impacts will occur as a result of this project. The project sponsor will need to secure a 404 permit pursuant to the Federal Clean Water Act from the Army Corps of Engineers as well as a 124 permit pursuant to the Montana Stream Protection Act from DFWP prior to undertaking any construction activities.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$76,450. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. Work shall be designed and/or approved by NRCS, USBR or another equally qualified entity. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 27

Applicant Name: City of Missoula
Project Name: Missoula-Reserve Street Sewers

Amount Requested: \$ 100,000 DNRC Grant

Other Funding Sources: \$ 400,000 CDBG Grant
\$ 500,000 TSEP Grant
\$ 100,000 Missoula Valley Water Quality District
\$1,580,000 SID Loan
\$ 614,000 Revenue Bond

Estimated Total Project Cost: \$3,294,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Missoula's Reserve Street South Sewer Project will install a gravity sewer system, including gravity mains and service connections where appropriate, in the project area. This densely populated, primarily low-income area currently has no available sewer service.

The Missoula Valley aquifer has been designated the only sole-source aquifer in HUD's Region VIII. The Missoula aquifer is the community's only source of drinking water, and, according to current research, it is extremely vulnerable to contamination. Protecting valuable water resources is a high priority for the community. Groundwater quality is adversely affected by the use of septic systems in highly developed areas. The proposed project was designed to safeguard the fragile aquifer by sewerage a densely populated area of the city.

In January 1996, the Missoula Valley Water Quality District completed a study of eight high density unsewered areas to evaluate the need for connection of homes and businesses in the areas to sewage treatment facilities. The study prioritizes the areas for connection based on the degree of water quality degradation and potential health risks in each area. This study concluded that, "Based on all of the factors considered, the East Reserve Street area represents the most significant threat to water quality and public health. With 26 percent of all unsewered units in this one area, the total loading to groundwater is higher than any other area. The proposed project is the first step to sewerage the above referenced area.

It is vital that we continue our commitment to protect Missoula Valley water resources by making sewer service available and connection a priority in the highly developed areas of Missoula. The proposed project is an important component in the process of protecting Missoula's sole-source aquifer and the quality of the Clark Fork and Bitterroot rivers.

Technical Assessment:

Background:

This project is intended to protect the Missoula Valley aquifer, the primary source of drinking water for many Missoula Valley residents. The area of concern is highly developed with marginal septic systems located in porous soils with little

separation from groundwater. A number of technical studies have been completed on the Missoula's sole-source aquifer, many suggesting a pollutant threat originating from the study area. The public health and environmental issues were well defined in the report and the need for the project is significant. The project area includes almost 2,500 residents located in a urban area near Reserve Street in Missoula.

Approach:

The approach suggested for this project would provide conventional sewer service to the study area with treatment of collected wastes provided by the City of Missoula wastewater treatment plant. While the technical documentation in the report suggests a viable solution to the identified problems, limited supporting documentation was provided. Impacts to the Missoula wastewater plant from the hydraulic and organic loads were not addressed. Earlier involvement by DEQ in review of the engineering report would have been beneficial.

Administration:

The project will be administered by the Missoula City-County Office of Planning and Grants. If SRF funding is to be utilized, coordination with DEQ will be necessary. Administration of the financial aspects of the project will be complex, due to the variety of funding sources. The budget for the project established by the applicant is reasonable.

Financial Assessment:

This project will provide centralized sewer service for about 2,500 residents of Missoula at an estimated cost of \$3,294,000. Funding will be provided through the issuance of revenue and SID bonds, a TSEP grant of \$500,000, a CDBG grant of \$400,000, a local water quality district grant of \$100,000 and this request for a DNRC grant of \$100,000. The project budget for this project provides realistic costs to provide sewer service for this primarily established community located in the western part of Missoula. The project is dependent upon a combination of grants to keep costs at a feasible, although still high, user level.

Benefit Assessment:

The existing on-site septic systems discharge to the Missoula Valley aquifer. This water is a sole-source aquifer that serves as the primary source of drinking water for Missoula Valley residents. The high density of septic systems, porous soils, and high groundwater have created a potential for groundwater contamination, which is somewhat substantiated with numerical data. This project will remove a significant source of potential pollutants to the aquifer. The citizens of the Missoula Valley will directly benefit from maintaining the quality of this water supply.

The benefits of the project are contingent upon residents and businesses in the area connecting to the new sewer lines. All properties must pay the SID assessments regardless of whether or not the property is connected to the system. This policy should provide strong encouragement to connect to the system. DNRC further recommends that the city require connection to the system as a condition of sale of any property in the area. The issuance of permits for any new construction should be made contingent upon connection to the system.

This project implements the policy objectives of the State Water Plan through the protection of sole-source aquifers from contamination.

Environmental Evaluation:

Short-term environmental impacts associated with project construction are unavoidable. Also not addressed, was the

capacity of the Missoula wastewater treatment plant to receive this additional sewage load. DEQ has documented excessive nutrient loading in the Clark Fork River that has resulted in violations of Montana water quality standards. Because DEQ must approve final plans and specifications for construction of the project, DNRC is relying upon DEQ to consider the impacts of adding this additional effluent into the Missoula treatment plant. DNRC encourages the city and DEQ to identify a long-term solution to this problem.

Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured.

The project shall be designed, reviewed, and constructed in strict accordance with DEQ requirements. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 28

Applicant Name: Fort Shaw Irrigation District
Project Name: Irrigation Efficiency and Water Quality

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 290,700	Project Sponsor
	\$ 83,200	U.S. Bureau of Reclamation
	\$ 24,600	Natural Resources Conservation Services
	\$ 7,200	Cascade County Conservation District
	\$ 26,000	EPA

Estimated Total Project Cost: \$ 531,700

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The Fort Shaw Irrigation District is the second largest irrigation project on the Sun River. It distributes water to approximately 10,000 acres on 177 farms between Simms and Fort Shaw. The project was originally completed in 1908 with a small rehabilitation program completed in 1961. The aging headgates and delivery system of 12 miles of canal and 89 miles of laterals are in dire need of repair and lining to reduce the significant water loss and water quality degradation. The impacts can be seen for miles, with losses of 10,000 acre-feet of water per year, which equates to 54 percent of the water removed from the Sun River by the district. These seeps also mean significant loss of productive land from salinity that moves with the water and also water quality degradation for many other uses from the return flows into the Sun River.

This project will install gauges and remote control gates to monitor water use where feasible, start a ditch lining program

to reduce the significant seep problem, and evaluate other water conservation options to integrate with the USBR water conservation program. These improvements will reduce seep and thus improve system efficiency, enabling the district to divert less water (allowing more water to remain in the Sun River) and improve water quality from reduced chemicals and salinity in the return flows.

The goals of this project are: (1) improve overall irrigation efficiency, (2) reduce loss of land from salinity, and (3) improve water quality and quantity in the Sun River from these improvements.

The objectives to reach this goal are: (1) line canal and laterals, (2) install remote operated gates and gauging stations, and (3) conduct extensive water conservation review with Bureau of Reclamation and others.

Technical Assessment:

Background:

Fort Shaw Irrigation District is located 25 miles west of Great Falls. Water is diverted from the Sun River to irrigate approximately 10,000 acres. Responsibility for operation and maintenance of all irrigation facilities is held by the irrigation district.

A 1982 USBR study report identified a need for a program of canal lining and replacement of obsolete facilities within the irrigation district. The report indicated that the project was old and unlined canals and laterals and deteriorated facilities have resulted in excessive canal and lateral leakage, poor service to water users, high groundwater conditions, and high operation and maintenance costs. The proposal indicates the estimated system efficiency is 46 percent; thus, the 54 percent of water loss results in saline seeps and water quality impacts to the Sun River from return flows.

The Fort Shaw Irrigation District received a grant authorization in 1995 to fund the installation of a new siphon. Completion of this project would have required a \$200,000 loan in addition to the grant authorization. Further analysis showed that the siphon was a lower priority than the water conservation efforts identified in this application. In fact, if water savings are as large as projected, the siphon may not need to be replaced at all. The applicant first wanted to apply the 1995 grant authorization to fund the new water conservation proposal. However, DNRC did not feel that the two projects were similar enough and recommended submission of a new grant application. A new application provides DNRC a description of the proposal scope and budget that is useful in developing a contract agreement. It also provides the legislature the opportunity to either allow grant funding from 1995 revenues or award a new grant for the project. In either case, the irrigation district does not wish to proceed with the installation of a new siphon.

Approach:

The proposed project involves:

- 1) automation of the headgates at the diversion from the Sun River to allow remote operation;
- 2) installation of a gauging station at the headgates at the diversion from the Sun River;
- 3) lining of approximately 3,400 feet of canals that have the greatest amount of seepage; and
- 4) conducting an extensive review of the irrigation system to identify further practices and actions needed to increase system efficiency.

The headgate automation and gauging station installation will be completed with assistance from USBR. The canal lining and system review will be performed with assistance from USBR and NRCS. Water quality of return flows to the Sun River will be monitored in cooperation with DEQ. The proposed project implementation, monitoring, and results will be conducted in coordination with the Sun River watershed efforts.

A plan to measure and document decreased appropriations of water from the Sun River and water quality and quantity of return flows, once efficiency increasing structures are in place, should be incorporated into the project. The project is scheduled to be conducted over a two-year time period.

Administration:

The Fort Shaw Irrigation District will oversee project administration in association with the department and USBR, NRCS, Cascade Conservation District, and EPA.

Financial Assessment:

The proposed project's total cost is \$531,700. The district's \$100,000 grant request includes \$85,500 for construction costs, \$5,000 for professional/technical costs, and \$9,500 for contingencies. The district will contribute \$13,200 for administration costs, \$2,500 for professional/technical costs, and \$275,000 for construction costs. USBR will contribute \$26,700 for professional/technical costs, \$2,500 for administration costs, and \$54,000 for construction costs. NRCS will contribute \$400 for administration costs, \$22,200 for professional/technical costs, and \$2,000 for construction costs. EPA will contribute \$26,000 for professional/technical costs. Cascade County Conservation District will contribute \$3,000 for administration costs, \$2,200 for professional/technical costs, and \$2,000 for construction costs.

The engineering review and planning component of this grant may identify additional costs beyond those outlined in this application.

Benefit Assessment:

The proposed project would provide conservation and management of water resources in the Sun River basin. Preservation and/or rehabilitation of water quality and soil resources should occur through water measurement, better control of water diverted at the headgates, and canal lining by reducing return flows and seepage. The assessment information could provide continued benefits in the basin if applied properly. Support from local entities is documented. The project is part of the larger Sun River watershed effort.

This project would implement the policy objectives of the State Water Plan sections regarding agricultural water use efficiency, conservation, and sustainability; increasing instream flows; support of family farms; integrated water quality/quantity management through potential water quality improvements in Sun River and local aquifers; and drought management through improved water management.

Environmental Evaluation:

No significant, long-term adverse environmental impacts will occur as a result of this project. Temporary soil and vegetation disturbance will occur during the construction phase of the project at the headgates and canal lining sites. Increased sediment discharge into the river at the headgates site probably will occur during construction.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. The applicant shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 29

Applicant Name: Custer County Conservation District
Project Name: Demonstration of Livestock Waste Utilization on Irrigated Croplands Using Surface Irrigation and Solid Waste Spreading

Amount Requested: \$ 97,460 Grant
Other Funding Sources: \$ 2,400 Project Sponsor
\$ 35,700 Montana State University

Estimated Total Project Cost: \$ 135,560

Amount Recommended: \$ 97,460

Project Abstract: (Prepared and submitted by applicant.)

Grant funds are requested to support implementation, monitoring, and demonstration of four on-farm confined livestock waste utilization and disposal systems. Current state water quality protection statutes mandate containment and disposal of liquid and solid waste from livestock facilities where the potential for impairment of Montana surface or groundwater due to runoff exists.

Practical, beneficial, sustainable methods of waste disposal and utilization have been designed and implemented to supplement crop fertilizer and irrigation water needs in other mid-western and Great Plains states. Such practices are in need of demonstration, evaluation, assessment, and application to promote and enhance livestock operator acceptance in eastern Montana.

This project will consist of demonstrations of the use of livestock liquid waste contained in lagoons and stockpiled waste in conjunction with water spreading, conjunctive use (mixing with existing water supplies), and manure spreading. Measurements will be made of reductions in fertilizer requirements, irrigation water requirements, crop responses, and runoff water quality. This information will be used to substantiate management recommendations presented to livestock producers as part of the educational component of this project.

One demonstration site would be located at the Fort Keogh livestock research facility, where detailed measurements of water quality protection, crop utilization, irrigation efficiency, nutrient movement, and soil and water quality would be made for presentation to livestock producers. Three on-farm demonstration sites would be similarly managed in cooperation with livestock producers within the participating conservation districts. Similar measurements of irrigation water utilization, fertilizer reductions, crop responses, irrigation water reductions, return flow water quality, and runoff prevention would be gathered and presented to interested livestock producers through a series of field tours, organized educational programs, publications, and public meetings.

Technical Assessment:

Background:

The proposed project is to demonstrate on-farm livestock waste disposal and utilization systems in Eastern Montana.

Current Montana water quality laws mandate system alterations to livestock facilities where potential exists for impairment of surface and/or groundwater. However, well-defined, evaluated management plans for containment and utilization of livestock wastes from these facilities have not been available to Montana producers. Three on-farm demonstration sites will be located at livestock facilities within the cooperating conservation districts. One demonstration site will be located at the Fort Keogh Livestock Research facility in Custer County.

Approach:

Best management practices (BMP's) and new technologies with potential to become BMP's will be used at the on-farm sites. BMP's will also be used at the Fort Keogh site but will include collection of advanced and extensive data such as detailed water quality analyses, soil sampling, plant tissue sampling, or other analyses that assist in further assessment of emerging management techniques. Implementation of the project will include:

- (1) development of acceptable waste disposal at the demonstration sites;
- (2) installation and initiation of demonstrated waste utilization practices and associated monitoring/analyses of these practices on runoff water quality, soil characteristics, crop growth, and irrigation requirements. This will include quantification of the nutrient composition of runoff water, waste piles, and irrigation runoff water and of the nutrient contribution of livestock waste to irrigated cropland;
- (3) application and analyses of irrigation management techniques to improve waste distribution such as surge irrigation, irrigation scheduling, and furrow packing;
- (4) application and analyses of techniques of applying livestock waste to irrigated land such as manure spreading, mixing of liquid waste with irrigation water, and flocculating polymer use; and
- (5) application and analyses of techniques to prevent livestock wastes from reaching water sources such as vegetative filter strips.

Field tours for producers will be held to address waste disposal/utilization and water quality protection. Information from the project and general observation of the demonstrations will provide training and education for local, state, and federal agency personnel as well as consultants involved in design, implementation, and monitoring of livestock waste utilization practices for water quality protection. A management guide of recommended livestock waste disposal and utilization techniques will be published for distribution to producers through the MSU Cooperative Extension Service, NRCS, and conservation districts.

Several reviewers expressed concern that two years would not be sufficient to evaluate the results of the project and suggested that monitoring continue for a minimum of four years. DEQ should be contacted to determine if activities proposed in the application will require permitting to address potential impacts to surface and groundwaters.

Administration:

This project is sponsored by Custer County Conservation District in cooperation with Treasure County Conservation District, Rosebud Conservation District, Richland County Conservation District, Prairie County Conservation District, MSU, NRCS, and the Agricultural Research Service. Personnel from MSU, including a graduate student, will complete the work tasks of the project under contract with the project sponsor.

Project implementation is scheduled over a two-year time period.

Financial Assessment:

The proposed project's total cost is \$135,560. Custer County Conservation District's \$97,460 grant request includes

\$97,460 for professional/technical costs. The district will contribute \$2,400 for administration costs. MSU will contribute \$35,700 for professional/technical costs. The applicant did not justify the project costs outlined in the project budget. There was no information on how the allocation of funds to each budget category was developed.

Benefit Assessment:

Benefits of the project will result from the use of information by livestock producers to properly utilize and dispose of livestock waste. Implementation of the practices developed through this project could result in the reduction or prevention of point and non-point source pollution.

Proper utilization of livestock waste will improve waste management, thereby preventing impairment to surface and groundwater sources. Some conservation of water through improved irrigation management should occur.

This project implements the policy objectives of the State Water Plan regarding non-point source pollution through development of voluntary BMP's for industry and management; determination of BMP effectiveness through educational demonstration projects; and use of a proactive approach to groundwater management by prevention, education and conjunctive management and protection of surface/groundwater resources from non-point source pollution. The project promotes agricultural water-use efficiency and supports family-owned farms.

Support is documented from local entities. Information from the project should be available statewide.

Environmental Evaluation:

The proposed project involves implementation, monitoring, and demonstration of livestock waste utilization and disposal systems in regards to point and non-point source pollution prevention and remediation. Potential adverse environmental impacts involve possible point or non-point source pollution of surface water and/or groundwater from the demonstration sites during implementation of the study.

Recommendation:

DNRC recommends grant funding of \$97,460, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMP's in the design and construction/execution of this project.

The project sponsor shall obtain all required permits for livestock waste application and for the livestock confinement facilities before grant funds are disbursed. No grant funds will be used to pay for university indirect costs.

Project No. 30

Applicant Name: City of Thompson Falls
Project Name: City of Thompson Falls Waterline Replacement II

Amount Requested: \$ 100,000 Grant
 \$ 100,000 Loan

Other Funding Sources: \$ 348,345 TSEP Grant
 \$ 10,250 City of Thompson Falls

Estimated Total Project Cost: \$ 558,595

Amount Recommended: \$ 100,000 Grant
 \$ 100,000 Loan

Project Abstract: (Prepared and submitted by applicant.)

The project consists of replacing dead-end and undersized mains within the system. The city currently utilizes surface water from Ashley Creek. During periods of high peak demand, the city utilizes two wells.

Areas proposed to be replaced are constructed of cast iron, steel, and asbestos cement lines. Many of these lines have been replaced, but many are still undersized and should be replaced with larger lines. Aside from undersized mains, a concern exists with dead-end lines. Several areas within the system have dead-end lines causing a potential health and safety threat.

The proposed project would benefit approximately 650 services and 1,500 users. This project is necessary to ensure that Montana state statutes are met and to ensure that necessary measures are taken to provide sufficient health and safety care to all those living in the City of Thompson Falls.

Technical Assessment:

Background:

The goals of this project are:

- (1) to increase fire protection in the upper pressure zone and Highway 200 commercial district;
- (2) to reduce health and safety risks associated with dead-end mains and inadequate looping of the water system; and
- (3) to reduce leakage through the water distribution system.

Sections of the water distribution system that are proposed for replacement consist of cast iron, steel, and asbestos cement pipe. Many of these lines have been replaced, but many are still undersized and should be replaced with larger lines. There are also many dead-end mains within the water distribution system that allow for stagnant water and possible bacteriological growth.

Increasing fire protection to residential and commercial districts in the City of Thompson Falls has been a growing concern over the years because many areas within the system do not meet recommended fire flows. All three of the city's pressure

zones have fire flow problems. The proposed water distribution system project would improve fire flow conditions in the upper pressure zone and the commercial district along Highway 200.

The existing distribution system also has a major leakage problem of approximately 275 gallons per minute, which significantly reduces the amount of water available to meet the average and maximum day water demands of the community. Because of the extremely rocky and porous soil in the Thompson Falls area, water mains were often laid shallow and are therefore prone to earlier deterioration from heavy traffic loading and freeze/thaw cycles. The porous soil allows leaking water to move downward rather than surface, thus making leak detection difficult.

Approach:

The proposed water main rehabilitation project includes five of the highest-priority water main problem areas. More specifically, the improvements will be:

- (1) installation of a new 8-inch main from the Jefferson Street reservoir feed, bypassing the reservoir and connecting to the existing 10-inch main south of the reservoir;
- (2) installation of a new 10-inch main from Forth Avenue and Church, running south to Haley Avenue and connecting to an existing 10-inch main;
- (3) installation of a new 6-inch main at the intersection of Forth Avenue and Greenwood Street, running north to Fifth Avenue, and then east with a connection at the intersection of Fifth Avenue and Church Street;
- (4) installation of a new 8-inch main at the intersection of Jefferson Street and Haley Avenue, running east to Spruce Street and north to Third Avenue; and
- (5) installation of a new 6-inch main from 4th Avenue and Ferry Street, running north to 5th Avenue and east to Greenwood Street.

Administration:

The proposed project would be administered by the City of Thompson Falls and could be completed by the end of 1998 if all requested funding is received during the summer of 1997.

Financial Assessment:

The City of Thompson Falls is requesting a \$100,000 grant and a \$100,000 loan from the DNRC, as well as \$348,345 from TSEP. With the addition of the city's contribution of \$8,750 for in-kind contributions and \$1,500 for a preliminary engineering expense, the total project cost is \$558,595. All funds requested from DNRC and TSEP are needed to complete the full scope of the proposed waterline improvements. If TSEP funds are not awarded, then \$200,000 from DNRC could be used to finance part of the improvements.

The City of Thompson Falls has a separate DNRC application under review at this time for its proposed new well (see Project No. 42). That application is also a request for a \$100,000 grant and a \$100,000 loan from DNRC. The two applications fund different components of an overall system rehabilitation.

Benefit Assessment:

The proposed waterline replacement project is intended to reduce the amount of distribution system leakage of treated water, increase fire protection, and eliminate dead-end mains. Leakage in the distribution system is estimated at approximately 275 gallons per minute. This amount is the equivalent to 444 acre-feet per year. Increased fire flows will protect property and life. The elimination of dead-end mains will reduce the risk of biological and chemical contamination.

The draft Thompson Falls water system master plan document was completed in May 1996. It was supported by the community, and the proposed waterline improvements are an implementation of the highest-priority items in that document.

The proposed project indirectly supports the policy objectives of the "Drought Management" section of the State Water Plan by improving water-use and conveyance efficiencies in a municipal system, and improving the beneficial use of water.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of this project. Since this is a waterline replacement project within city limits, no previously undisturbed ground will be overturned. The temporary adverse impacts of dust, noise, and traffic disturbance will be experienced in both commercial and residential areas during the construction phase of the project.

Recommendation:

DNRC recommends that the City of Thompson Falls receive a \$100,000 grant and a \$100,000 loan to help finance this proposed water distribution system. Grant and loan funds for the project will be available after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project. Final plans and specifications must be reviewed and approved by DEQ before construction may begin.

Project No. 31

Applicant Name:	City of Chinook	Loan Only
Project Name:	City of Chinook Water Treatment Plant Improvements	
Amount Requested:	\$ 294,000	Loan
Other Funding Sources:	\$ 313,555	TSEP Grant
	\$ 19,555	Sponsor's Water Reserves
Estimated Total Project Cost:	\$ 627,110	
Amount Recommended:	\$ 294,000	Loan

Project Abstract: (Prepared and submitted by applicant.)

On December 2, 1995, the city received a letter from DEQ indicating that the clear well disinfection "contact time" at the treatment plant does not meet state requirements. This is a "treatment technique" violation of the Administrative Rules of Montana (ARM) 16.20.208. Quarterly public notices are required until the violation has been corrected. This disinfection contact time violation represents a health threat to the residents of Chinook. The disinfection regulations provide standards for treatment to protect the public from diseases transmitted through the municipal water system. This violation consists of inadequate contact time with the chlorine to complete disinfection of municipal drinking water.

The city has experienced many problems with the raw water intake. The intake is lowered with a well screen attached to the end of the intake pipe housed in a concrete vault next to the radial arm gate. Water enters the intake vault either through two pipes with slide gates or over the top of a weir that includes a 3-inch bar screen to prevent large debris from entering the vault. Due to the fact that the concrete is lowered and velocity of the water is reduced, sediment buildup in this structure is a significant problem. Ice jams in the Milk River have caused damage to the weir over the past two years. These ice jams have not allowed access to the intake structure and have threatened the water supply for Chinook. During the winter of 1995-96, an ice jam coincided with plugging of the intake screen. Lack of access to the intake prohibited the operator from clearing the blockage. With assistance from the fire department, the city crew installed a temporary pumping system to provide water to the treatment plant.

The existing backwash water ponds cannot be fully dewatered due to the groundwater leaking into the basins. This fact suggests that the existing liners have failed and that there is a potential for groundwater contamination. Relining the basins would protect the aquifer and allow drying in these basins.

The terms of the revenue bond required for the DNRC loan are less expensive than conventional financing. The city's rate payers will benefit from the reduced bond counsel fees and reserve requirements. The city is also applying to the Treasure State Endowment Program for a \$313,000 grant. Without the grant funds, the residents of the city would experience a substantial rate increase. The anticipated residential user rate increase, with the DNRC loan, is \$3.98 per month. The current average monthly system rate for water is \$19.38 and for sewer is \$24.37 for combined rate of to \$43.75. According to the TSEP staff, the combined targeted rate for Chinook is \$31.81. The residents of Chinook now pay above the targeted rate. The proposed rate increase will bring their combined rate to \$47.73.

Technical Assessment:

Background:

The City of Chinook obtains its water from the Milk River. Raw water is diverted to a water treatment plant (constructed in 1976) through an intake structure adjacent to the plant. The intake structure, which was rebuilt in 1993, includes a weir that spans the river. The existing plant consists of packaged treatment units that provide flocculation, settling, and filtration in two compartmentalized tanks.

During a routine inspection in 1995, the Water Quality Division noted several deficiencies with the treatment plant. The major deficiency identified involved the clear wells. The system does not currently allow adequate contact time for the chlorine to provide sufficient disinfection. The city has also experienced recent difficulty in drawing water from the Milk River during high water periods.

Approach:

The city retained an engineering firm to perform an evaluation and prepare a master plan for the water system. The plan identified \$2,388,500 in improvements that need to be performed. The city consolidated the master plan items needing immediate attention into a phase I program. These include: rehabilitation of the existing sedimentation basin for chlorine contact and storage; modifying the existing raw water intake; relining the backwash water ponds, renovating the package filtration system; replacing and renovating the chemical feed system and relocating the inlet flow meter. Completion of phase I improvements will address the major deficiencies identified in the DEQ inspection report.

The technical documentation presented is sound. The engineering analysis was thoroughly prepared having analyzed existing facilities, explored available alternatives, and recommended feasible, cost-effective alternatives. The proposed improvements should completely solve the major identified deficiencies and bring the treatment plant into compliance with

applicable standards.

Administration:

The proposed time line, with design starting in fall of 1997 and construction completed in the summer of 1998, appears reasonable and takes into account timing of funding agencies. Construction cost estimates are reasonable and the budget appears adequate to complete the project.

Financial Assessment:

The estimated cost for the proposed project is \$627,110. The applicant is requesting a \$294,000 DNRC loan to pay for administration (\$23,670), engineering (\$41,000), construction (\$185,330), and contingencies (\$44,000). An application has been made to TSEP for a grant of \$313,555 for the balance of the project. As its contribution to the project, the city is claiming \$19,555 in monies already expended to pay for the engineering analysis.

The current average residential user rate is \$19.38. With DNRC and TSEP assistance, the rates are anticipated to increase \$3.98 to \$23.36 per month. The estimated costs and project budget appear reasonable. The project is financially feasible, assuming the requested funding is secured.

Benefit Assessment:

However, the improvements will provide for better management of the treatment facility and result in benefit to the local community by providing for a reliable, safe water supply.

The proposed project does not directly implement the policy objectives of the State Water Plan because the project does not address water management or surface or groundwater quality.

Environmental Evaluation:

No adverse environmental impacts are anticipated due to the proposed improvements. All work will be performed at the existing treatment plant and intake sites. Potential beneficial impacts should be realized by a more efficient water treatment facility, improved water quality, and reduced threat to public health.

Recommendation:

A loan of up to \$294,000 is recommended for the water treatment facility improvements proposed by the City of Chinook. The loan should be provided commensurate with the project sponsor's ability to repay the principal and interest according to terms specified in a DNRC bond purchase agreement. Loan funds for the project will be provided after DNRC approves a scope of work, project administration, and project budget.

The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 32

Applicant Name: Park County
Project Name: Hydrogeological Reconnaissance Study of the Paradise Valley

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 15,900 Project Sponsor
\$ 100,000 U.S. Geological Survey

Estimated Total Project Cost: \$ 215,900

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Rapid expansion of residential development into the Paradise Valley has recently prompted local residents to develop a land-use plan to protect and maintain the high quality of the valley's natural resources. However, current knowledge is insufficient to guide planning efforts to protect the aquifers that underlie the valley, provide the sole source of drinking water to all its residents, and contribute flow to the nationally acclaimed Yellowstone River. Therefore, an understanding of groundwater resources was identified as an essential component of the land-use plan that requires further development. The proposed project will address this component by characterizing the groundwater system, thereby providing a sound basis for responsible land-use planning.

The goal of the proposed hydrogeological assessment is to provide unbiased scientific information regarding the basin-fill aquifers that underlie the Paradise Valley, including water quality and the availability of groundwater for future development. The proposed project will describe the general characteristics of the basin-fill aquifers; determine the altitude of the water table and general directions of groundwater flow; identify important recharge and discharge areas; characterize groundwater quality; and design a long-term monitoring system.

A reconnaissance-level approach will be used to achieve these objectives. Existing information will be compiled from various databases and reports. Wells and springs will be inventoried throughout the study area to document and field-verify well depths, water levels, pH, specific conductance, temperature, nitrate concentrations, and well-construction data. Water levels will be measured monthly in a representative subset of inventoried wells. Water samples will be collected and analyzed to characterize the natural chemical quality of water from each aquifer, and to identify possible areas with existing contamination. In a reconnaissance-level assessment like this, it would be possible to miss small areas of contamination, or any area contaminated with a substance that we don't sample for contamination. Generalized groundwater flow paths will be delineated and major recharge and discharge areas will be identified.

Technical Assessment:

Background:

The proposed project involves a reconnaissance level study of the groundwater resource underlying the Paradise Valley, south of Livingston. The study is to provide a description of current groundwater conditions under existing land-use practices through gathering of baseline information. This baseline information can then be used to evaluate future changes that may result from land and water uses.

Approach:

A long-term monitoring system will be established to detect changes. The data will be used to provide for proper land-use planning. The hydrogeological study will be conducted in cooperation with the U.S. Geological Survey (USGS). Existing hydrogeological data from the records of USGS, MBMG, MSU, and other sources will be reviewed and analyzed. A hydrogeologic map of the area will be compiled from this information. Approximately 200 existing wells and springs will be inventoried throughout the study area. Field inventory will include measurement of water quality parameters, water levels, well depths, and specific capacity (where possible). Location, altitude, aquifer, water-use, and well construction data will also be recorded. A physical description of the geologic deposits that comprise the aquifers will be provided from well driller logs. Aquifer hydraulic characteristics will be described qualitatively on the basis of natural discharge areas, geologic structure, grain-size distribution, well driller log data, and any specific capacity tests conducted during the inventory. Groundwater flow paths will be determined using the data collected. All data will be incorporated into the MBMG groundwater assessment program.

The project sponsor should coordinate this study with the Montana Ground Water Assessment Program administered by MBMG. MBMG staff should be included in a planning meeting early in the scope-of-work process to facilitate the exchange of information through the course of the project.

Other technical study components that should be considered include:

- (1) hydrogeologic and geologic mapping of the project area performed at a scale of at least 1:24,000 to allow Park County to evaluate septic tank placement;
- (2) acquisition of data wherever possible, from wells completed in adjacent bedrock units so that hydrologic conditions in the valley margins might be compared to those in aquifers within the valley;
- (3) estimation of mountain-front recharge to the valley-fill aquifers, either as stream losses or groundwater discharge into the valley fill. Mountain-front recharge may be more important as a source of recharge than the presence of the Yellowstone River in many parts of the basin.

Administration:

The county will administer the grant contract and will contract with USGS and MSU to conduct the study. A USGS hydrologist and technician will perform the tasks associated with the study and monitoring network. An Earth Science Department student from MSU will assist with the field work. The county will operate the monitoring system after the study is completed. The system will be designed to include and be complementary to existing monitoring in the area, such as the MBMG statewide Groundwater Monitoring Program. All inventory and monitoring efforts will be designed to include and be complementary to MBMG activities/program.

Project implementation is scheduled over a 27-month period.

Financial Assessment:

The proposed project's total cost is \$215,900. Park County's \$100,000 grant request includes \$15,600 for administration costs and \$84,400 for professional/technical costs. Park County will contribute \$15,900 for professional/technical costs. USGS will contribute \$15,600 for administration costs and \$84,400 for professional/technical costs.

Benefit Assessment:

Information gathered through the course of this study and continued monitoring will help Park County land-use planners

and decision makers manage and preserve the groundwater resource. The proposed project would implement policy objectives of the State Water Plan regarding integrated water quality/quantity management through a long-term planning, proactive approach to groundwater management. The project further supports the objective of watershed investigations that facilitate streamflow/water quality management and groundwater development plans. Support is documented from a broad range of local entities and individuals.

Environmental Evaluation:

No significant, long-term, adverse environmental impacts should occur from the water sampling/measurement from the wells, if conducted properly.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. Grant funds may not be used to pay for USGS overhead costs or university indirect costs. DNRC will only reimburse eligible project costs with grant funds.

Project No. 33

Applicant Name: City of Twin Bridges

Project Name: Water System Improvements

Amount Requested:	\$ 100,000	Grant
	\$ 200,000	Loan

Other Funding Sources:	\$ 500,000	TSEP Grant
	\$ 400,000	CDBG Grant
	\$ 68,500	Local Funding

Estimated Total Project Cost: \$1,268,500

Amount Recommended:	\$ 100,000	Grant
	\$ 200,000	Loan

Project Abstract: (Prepared and submitted by applicant.)

The proposed project consists of improvements to the City of Twin Bridges' water supply, storage, and distribution system. The following summarizes the proposed improvements.

A 300,000-gallon reservoir will be constructed on a grade east of town. A 12-inch transmission main will connect the reservoir to the existing distribution system. The new reservoir will: (1) increase the available storage from 50,000 to 300,000 gallons, thus meeting the Insurance Service Organization's requirement for suppressing major fires; and (2) provide increased pressures for fire flows and domestic use throughout town, thus satisfying requirements of the existing population and providing for future growth possibilities.

Distribution system improvements include replacing antiquated, lead joint, cast iron pipes with new mains. Large flows through existing lines are severely retarded due to undersized pipes containing significant tuberculation on the interior. The lines have begun to fail as evidenced by numerous repairs of breaks and leaks the past few years. Installation of new PVC pipe, gate valves, fittings, and fire hydrants will provide the necessary distribution network to residential and commercial areas. Fire flows and low pressures will be increased allowing public health and safety to be improved.

Both wells need minor improvements including pressure release valves, pump control valves, flow meters, and miscellaneous piping.

Technical Assessment:

Background:

The existing municipal water system in Twin Bridges consists of two deep wells that produce adequate quantities of good quality water; a 50,000-gallon elevated water storage tank; and a leaking, lead joint, cast iron distribution system. Flows through existing lines are severely retarded due to undersized pipes containing significant interior corrosion and tuberculation. This condition, in combination with inadequate storage, produces low system pressures in some locations and inadequate fire flows to meet requirements for suppressing major fires.

The objective of this project is to provide a municipal water system that will meet fire flow requirements, will provide efficient and economical operation, and will allow for future community development. Commercial expansion is currently being hampered by inadequacies in the existing system as evidenced by low system pressures at the Winston Rod Company's new facility in Twin Bridges.

Approach:

Options exist for each of the project phases, including supply, storage, and distribution. The recommended option pertaining to supply is to install new controls and instrumentation for the pumps in each of the existing wells. This will prevent surges that will become severe as line sizes and operating pressures are increased. Storage options include storage reservoir material options (concrete versus steel); tank location (elevated construction in town or construction on high terrain adjacent to town); and construction alternatives (buried versus above grade). The selected option of an above-grade steel tank on elevated terrain adjacent to town is the most economical when analyzed in terms of present worth. Distribution options include zoning and material considerations. The decision to construct the system in two zones with PVC pipe is the most cost-effective choice meeting required performance criteria.

The approach being proposed is to construct the project in two phases. Phase I, consisting of the construction of well and distribution system improvements, is to be funded with local, DNRC, and CDBG funding. The new storage tank, phase II, is planned for construction with TSEP funding. The completion of the full scope of work will result in a system that will provide adequate fire protection and system performance for the next 20 years based on standard population projections.

A preliminary engineering report was prepared for the City of Twin Bridges in 1995 and 1996. The purpose of the *Twin Bridges Water System Analysis* was to identify deficiencies and recommend improvements. Technical documentation contained in that report is adequate for purposes of a preliminary analysis, including detailed engineering cost estimates.

Administration:

The City of Twin Bridges is not under mandate or court order to correct any deficiencies in its municipal water system.

However, the system currently provides inadequate pressures and fire fighting capabilities, and future expansion is limited.

Construction is scheduled for late 1997 and 1998. This is compatible with the availability of grant and loan funding currently being applied for. The project is being phased to allow for delays in TSEP funding, should such a delay or total lack of TSEP funding exist for the project.

Financial Assessment:

The town is making a good management decision in obtaining financing and planning improvements before they become critical. It is willing to commit \$68,500 in local reserves and services toward construction of the project. In addition, the town is proposing to borrow \$200,000 through the Renewable Resource Grant and Loan Program.

Based upon full funding of this project by all programs for which applications have been made, the monthly rate for a residential user will be \$25.20. This fee is consistent with established target rates for Montana. The application includes a preliminary engineering report entitled, *Twin Bridges Water System Analysis*. The analysis includes comprehensive engineering cost estimates and options for several construction and funding scenarios. The most cost effective scenario has been selected, based on a 20-year present worth analysis. The application also includes a design and construction budget, as well as an operating and maintenance cost analysis from which user rates were derived.

The project has been phased to allow for delays in funding. The budget is justifiable, and the spending plan is reasonable.

Benefit Assessment:

Potential public benefits include increased potential for development and growth, the addition of a reliable fire fighting capability for the community including the local schools, and the conservation of water and energy associated with water loss and additional pumping costs due to a leaking distribution system. Documentation is included with the application that demonstrates local support for the project.

This project indirectly implements the objectives of the State Water Plan. This project has strong local support, provides for public uses, improves local economic development, and protects local public health, safety, and welfare (fire).

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of this project. The temporary adverse impacts of dust, noise, and traffic disturbance will be experienced in both commercial and residential areas during the construction phase of the project. This project will be environmentally beneficial in that water-use efficiencies will be enhanced.

Recommendation:

DNRC recommends grant funding of \$100,000 and loan funding of 200,000 the total amount requested. In the event grant funds are not provided for this project, DNRC recommends increasing the loan authorization to \$300,000. Grant/loan funds for the project will be provided after DNRC approves a scope of work, project administration, and a project budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 34

Applicant Name: Lewis and Clark County
Project Name: Tenmile Creek Resource Assessment

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 16,010 Lewis and Clark WQPD
\$ 83,000 DEQ
\$ 9,200 Unknown

Estimated Total Project Cost: \$ 208,210

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Tenmile Creek watershed is the number one priority of the Lewis and Clark County Water Quality Protection District. Tenmile Creek is the major source of drinking water for the City of Helena and recharges the Helena Valley aquifer, the sole source of drinking water for Helena Valley residents. Six public meetings, held at citizen request during the past year, led to serious discussions regarding issues in the Tenmile watershed. However, lack of scientific information about the lower reaches of Tenmile Creek was identified as a major impediment to finding solutions to the identified problems.

Tenmile Creek fluctuates from being severely dewatered in summer months, with subsequent fish kills, to flooding and overtopping its banks during winter and spring. Tenmile Creek provides water to local irrigators, recreation to sportsmen in the area, and aesthetic satisfaction to subdivision homeowners who live in close proximity to the stream. Tenmile Creek also floods those same irrigated fields and subdivisions during periods of high water. In contrast, as a dewatered stream in the summer, Tenmile Creek cannot support a healthy fishery. As a documented recharge source, Tenmile Creek "loses" water to the Helena Valley aquifer. As one of the fastest growing localities in the State of Montana, the Tenmile Creek watershed faces future withdrawals of groundwater from wells adjacent to the stream and increased withdrawals from the stream in summer months that will exacerbate water quantity and quality problems already existing in Tenmile Creek.

Stakeholders in the Helena area have expressed a genuine desire to return Tenmile Creek to a healthy stream that will support an active fishery. The proposed scientific characterization of Tenmile Creek, with a concurrent public outreach program, will provide the necessary information for the public to make informed decisions regarding watershed planning and management of a major stream that traverses the Helena Valley and provides enjoyment to Helena area citizens and visitors.

Technical Assessment:

Background:

Tenmile Creek provides water for a variety of uses in the Helena area. Current irrigation and drinking water uses result in dewatering during certain times of the year, and yet, in the spring, the creek often floods the fields and subdivisions that use its water. In addition to providing drinking water and irrigation for local agricultural land, Tenmile Creek recharges the Helena Valley aquifer. Users are concerned that current and projected growth will only make existing water supply problems worse. When conducting meetings to address the problems, discussions are always limited by the lack of

scientific data. This proposal seeks to provide the data needed to best make decisions concerning the management of Tenmile Creek.

The proposal emphasizes the overuse of the resource, stream dewatering, and fisheries impacts. The application perhaps under-emphasizes some other issues that are addressed in the proposal, such as stream corridor issues, though these are presented in the proposal. The problem of flooding is also mentioned in the proposal but is not addressed by the project.

Approach:

The project sponsor seeks funds to assess the stream flows, water quality, and the biological and fisheries characteristics of lower Tenmile Creek. The options presented were the do-nothing option and an option to do a smaller less comprehensive study of the resource. For planning purposes, a comprehensive study is preferred. The proposed study will provide reliable, credible information for planning purposes.

Periodic measurements of stream flow and synoptic sampling of water quality to assess general stream flow characteristics is a common approach used in water-resources investigations by USGS. Similar projects have been conducted successfully in other locations in Montana. One reviewer expressed concern that the number and duration of synoptic measurements proposed for this project are too limited. The timing of measurements was not addressed in the proposal and should be addressed. It might be valuable to do some synoptic water quality measurements during and immediately following a storm event. It is likely that certain sediment and metal constituents are mobilized during run-off events in addition to periods of snow melt.

Water quality synoptic measurements on a drainage of this small size with its complexities of water use could pose some interesting problems. A change in an irrigation diversion on this highly appropriated stream might have a significant downstream impact. The drainage is also large enough that a sampling cycle may take more than one day. It is possible for a storm event, cloudy day, or a change in water use patterns to make interpretation challenging if these factors are not noted.

Stream gauging is understandably shut down during winter ice up periods. The application is not clear as to whether some manual measurements (2-3 gauging events) will occur during this period to verify base flow conditions.

Administration:

The project will be directed by USGS. The project sponsor will administer the grant and provide necessary reports. Conservation districts, NRCS, DFWP, USGS, and county government officials have been and will continue to be involved with the project.

Financial Assessment:

Total cost of the project is \$214,410. The project sponsor requests funding for \$100,000, which amounts to just less than half of the overall project cost. RRGL grant monies will be used to fund \$17,331 for project administration, \$68,869 for professional fees, and \$13,800 for technical fees. The project sponsor is providing match funding of \$16,010; USGS will provide \$83,000 in match funds and DEQ will provide \$6,200 worth of technical support. There is a \$9,200 shortfall in secured funds for the project, and these funds should be secured before grant funds are released to the project. Costs outlined in the grant application are consistent with costs typical of USGS streamflow studies. More detailed cost documentation should be provided by the project sponsor during the process of negotiating a grant agreement.

Benefit Assessment:

The project will collect scientific data that are necessary to address water management problems that influence conditions on Tenmile Creek. Existing uses result in dewatering during part of the year. These problems are likely to increase as population in the area grows. Discussions about the management of this resource are underway and involve public agencies as well as interested water users. Scientific data will provide the information necessary to begin making serious management decisions. The project involves water users in the Helena area. A public group involved in discussions about the resource and involvement by several public resource agencies indicates strong local support.

This project directly supports the State Water Plan recommendation of undertaking watershed-specific investigations, including modeling, that facilitate streamflow/water quality management plans.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with the project.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 35

Applicant Name: Hill and Liberty County Conservation Districts
Project Name: Water Resource Evaluation of the Middle Portion of the Sage Creek

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 3,550	Hill County Conservation District
	\$ 450	Liberty County Conservation District
	\$ 46,833	MT Bureau of Mines and Geology
Estimated Total Project Cost:	\$ 150,833	
Amount Recommended:	\$ 100,000	

Project Abstract: (Prepared and submitted by applicant.)

The water quality in the middle portion of the Sage Creek watershed in northern Hill and Liberty counties has undergone serious degradation. Residents notice discolored water with a thick foam layer during spring run-off and are not able to use it most of the year.

A recent lab analysis revealed high bacterial count, nitrate levels, and total dissolved solids. Other analyses show salinity that exceeds sea water. This investigation will pinpoint which processes (cropping systems, livestock management, and

oil field activities) are involved in causing the pollution.

Area landowners/producers united to organize a Sage Creek Watershed Project representing the geographical area. A steering committee has been active in notifying all potential participants and seeking funds for assessment and mitigation. Questionnaires and meetings gave a consensus to address all the non-point sources and not just salinity.

Numerous complaints describe the steadily degrading water quality in the shallow glacial outwash deposits serving domestic supplies. Rural water lines serving many households can not handle more demand without additional expensive infrastructure. It is imperative to protect the remaining surface and groundwater sources to safeguard the livestock industry, wildlife, and domestic farm sites dependent on wells.

The proposed project will identify and map existing wells, springs, and streams. Water samples from selected sites will be analyzed for inorganics. A professional hydrogeologist will direct data collection and interpretation to assess the extent of surface water and shallow groundwater contamination. Aquifer sensitivity and vulnerability will be derived from geotechnical information. The information is necessary for watershed planning for cropland, rangeland, riparian areas, and wildlife habitat.

The principal investigator is with MBMG. Chemical water analyses will be performed by the analytical division of MBMG. The project duration is 24 months, including two field seasons, commencing fall 1997 or when funds become available.

Technical Assessment:

Background:

The project seeks to assess the causes of degradation in the middle portion of the Sage Creek watershed, specifically the problem of salinization. The middle portion of Sage Creek includes the tributaries of Little Sage Creek, O'Brien Creek, and Four Mile Creek. The assessment is to provide information that will serve efforts on future salinity remediation and will therefore describe the direction of groundwater flow in the shallow glacial deposits and in the deeper sediments with information from well monitoring. Discharge measurements will be performed on Sage Creek and its tributaries to document where surface water is gaining flow from or losing flow to groundwater. Inorganic water analysis for surface and groundwater sites will be used to characterize water degradation. Sources of water contamination will be evaluated with respect to land-use practices.

The primary resource problem in the Sage Creek watershed is saline seep. Saline seeps are recently developed saline soils in non-irrigated areas that are wet some or all of the time, often with salt crusts. Once developed, saline seeps often grow at an average rate of 10 percent per year, soon making it difficult to farm around the problem.

In the Sage Creek drainage, water quality is getting worse. The first water that flows in the spring for irrigation is loaded with salt and is therefore not usable; it runs down the creek. Water runs out of the side hills and leaves salt deposits, which kill grasses and expose the land to erosion. Erosion has become a problem as a result.

Approach:

The goal of the proposed study is to evaluate and characterize sources and extent of surface and groundwater degradation. The product will be a resource assessment study that will be useful in determining how surface and groundwater sources interact with soils to result in significant salinization problems in the Sage Creek watershed. The information will be used by area land owners to help them better understand the problem and make decisions to take steps necessary to prevent

further resource degradation.

The application did not discuss how the study will be used to mitigate water quality problems in the watershed. Whether the information will provide new insight or scientific evidence to back up what is already known about the problem was not discussed. That there are already mitigation projects underway in the area also was not discussed.

Alternatives were not addressed in the proposal. One reviewer suggests funding only the well inventory portion of the project. The applicant did not provide sufficient justification for the alternative suggested. The proposed study is consistent with other groundwater assessment studies produced by MBMG. Whether the full scope of the project is necessary to serve the basic information needs of area land owners is not discussed in the proposal, and it is unclear whether this is the best approach.

Administration:

Hill County Conservation District will take the lead in project administration. Liberty Conservation District will also administer a portion of the grant. MBMG is the principal investigating organization. The proposal is consistent with other MBMG projects that have been funded in the past.

Financial Assessment:

Total estimated project cost is \$150,833. Grant funded expenditures amount to \$5,590 for project administration, \$40,716 for professional costs and \$53,694 for technical expenses. Hill County and Liberty County conservation districts will provide \$3,550 and \$450 respectively in matching funds for project administration. MBMG will provide the balance of \$46,833. All funds necessary for the project will be in place if the proposed grant is funded. The budget is reasonable for the scope of work outlined; any reduction in the amount awarded would require a reduction in the scope of work. The budget for the project is acceptable and consistent with the budget for similar groundwater assessment projects funded by MBMG.

More detailed cost information should be obtained from MBMG during the contract negotiation process. The project sponsor each will provide some in-kind match for their participation in the project. Some understanding of how these costs will be accounted needs to be developed before grant funds are provided.

Benefit Assessment:

A resource assessment study will add to the body of knowledge accumulated concerning salinity problems in this area. Additional information will help area land owners better understand the problem and will help them make management decisions that may improve the situation in the future. The salinity problem is a significant resource problem and merits efforts to provide a set of viable management solutions.

This project implements the policy objectives of the State Water Plan through support of studies addressing water quality/quantity issues in identified watersheds, and development of groundwater management plans. The project would support protection of water supplies for family owned farms.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with this project.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 36

Applicant Name: Lewis and Clark County
Project Name: Flood Hazard Mitigation Plan

Amount Requested: \$ 39,500 Grant
Other Funding Sources: \$ 3,000 Lewis and Clark County
Estimated Total Project Cost: \$ 42,500
Amount Recommended: \$ 39,500

Project Abstract: (Prepared and submitted by applicant.)

Lewis and Clark County is requesting funding for a Flood Hazard Mitigation Plan for the Helena Valley. The plan will provide an open forum for the identification and discussion of critical flood hazard issues faced by the community and present opportunities for concerted actions to correct any identified problems.

The plan will be a realistic assessment of the characteristics of the surrounding physical environment and the historical relationship of the community to the area as a whole and not be limited to the 100-year floodplain. The proposed plan will address key elements that influence the impacts of, and recovery from, any future flood event. Short-term and long-term opportunities for flood hazard mitigation will be considered. Construction of structures that would alleviate any potential flood hazard, as well as different policy issues, will be examined. Previous analysis of different areas of the Helena Valley will be incorporated into this flood hazard plan.

An important element of any effective planning effort is community participation. It is important that those who are directly impacted have ownership in the process. If not, any solutions identified will not be implemented and measures having a direct impact on their individual pocketbooks will not be completed. The county will use a collaborative, consensus-based process where all stakeholders are invited to identify any potential flood hazards, recommend and evaluate solutions and develop an implementation strategy. An ongoing community education and outreach process will be key to the success of the plan. Once the plan is completed, it will be incorporated into the capital improvement plan developed by the county for public works.

Technical Assessment:

Background:

The problem of flooding in Lewis and Clark County is indicated by the history of flooding that occurred in 1908, 1964,

1975, and 1996. In the past, the county has hired consultants to identify and study the different areas that are prone to flooding in the Helena Valley. While these studies identified improvements that are needed to relieve the threat of flooding, a comprehensive study of flood hazards and mitigation strategies has not been completed.

Approach:

The goals and objectives of this project are to: define the flood disaster history of the Helena Valley; identify flood hazards and risks; develop a hazard analysis; and define community mitigation strategies. It appears that the overall goal of this project is to reduce property damage from flooding in the Helena Valley.

The result of this project is the development of a flood hazard mitigation plan and implementation strategy. The applicant proposes to research potential flood hazards in the area and design alternatives for mitigation. The plan will not be limited to just the 100-year floodplain. It will examine policy issues and be incorporated into the County Works Department Capitol Improvements Plan. Also, this plan will be used as a model by the DNRC Floodplain Management Section to be followed by other communities in Montana.

Administration:

The applicant mentions working with DNRC and NRCS in project coordination. The applicant should also work closely with the Federal Emergency Management Agency (FEMA). The county should follow the model mitigation plan provided by FEMA as indicated in the application. This strategy will aid the county in obtaining funds potentially available from FEMA for plan implementation. It will be important that the project scope of work, RFP, and final plan be reviewed and approved by FEMA. Also the U.S. Army Corps of Engineers should be contacted for its input.

Financial Assessment:

Total cost for the project is estimated at \$42,500. The grant amount request is \$39,500, with the project sponsor committing \$3,000 matching funds to the project for administration. Match funds comprise 7 percent of the total project cost. The main cost in this project is the engineering consultant. The applicant states that this is based "upon an engineer's estimate." A consultant is working on a similar project in Libby for \$35,000, so \$39,500 seems reasonable.

FEMA has started a new program called Flood Mitigation Assistance, which will have funding for local community plans as well as projects on a allocated basis. This project has yet to be published in the Federal Register. FEMA does not know what Montana's allocation for funds will be under this new program.

Benefit Assessment:

Flooding in the Helena Valley over the past 20 years has been estimated to have caused over \$1 million in public and private property damage. The 1981 flood alone was estimated to have caused over \$600,000 in damages. Based on these figures, the project cost of \$39,500 appears to be economically feasible. The benefits seem to exceed the costs because continued flood damage is inevitable. The dollar amount of damages in future flood events are most likely to increase over the years due to inflation.

This project would be the first step toward reducing flood damage over the long term. The project may result in fewer tax dollars spent on flood fighting and flood repairs. The planning recommendations that result from this plan may be useful to the Helena Valley floodplain residents.

This project benefits are listed as primarily protecting human resources (public and private property). Flooding does have

a negative effect on natural resources such as water quality, soil erosion, groundwater supply contamination, riparian areas, and fish and wildlife, although these impacts are not discussed in the application.

This project implements the policy objectives of the State Water Plan. This proposal is a watershed specific investigation that will facilitate stream flow management plans. This project also addresses potential contamination of wells and is a planning tool for the future in keeping with state water plan objectives.

Environmental Evaluation:

This project will not have any significant adverse environmental impacts. Impacts may occur if recommendations in the plan are implemented in the future. Construction of flood control structures will have short-term effects on the stream increasing sediment loads. Long-term adverse impacts to the environment can result if flood control treatments are improperly designed or installed.

Recommendation:

DNRC recommends grant funding of \$39,500, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 37

Applicant Name:	City of Glasgow	
Project Name:	Glasgow Storm Sewer Separation	
Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 400,000	CDBG
	\$ 500,000	TSEP
	\$1,048,000	SRF Loan
Estimated Total Project Cost:	\$2,048,000	
Amount Recommended:	\$ 100,000	

Project Abstract: (Prepared and submitted by applicant.)

The City of Glasgow has been faced with increasing sanitation concerns, property damage claims, and environmental degradation caused by its combined sewage system. In an effort to alleviate these problems, the city is seeking financial assistance for a sanitary sewer separation project through the Community Development Block Grant Program, the Renewable Resource Grant and Loan Program, the Treasure State Endowment Program, and the State Revolving Fund Loan Program.

Glasgow's existing sanitary sewage collection system serves as a storm drainage collection system for 150 acres on the

city's south side. Storm water, which flows into the sewage collection system, causes raw sewage to chronically back up into the basements of local residences and businesses and to regularly overflow into the Milk River. Excessive storm water flows structurally attack the sanitary distribution network causing pressure and cracking of the sewer piping. This has resulted in premature repairs being mandated on the collection system. As a result of these and other related problems, the city must separate the combined collection system and is, therefore, pursuing loan and grant assistance to complete the necessary construction improvements.

Clearly, one of Montana's most valuable renewable resources, clean river water, is being degraded by the regular discharge of raw sewage from the combined collection system to the Milk River. Four alternatives have been evaluated for resolving this problem. These included: (1) no action, (2) constructing new sanitary sewers, (3) upgrading the existing combined system, and (4) constructing new storm drains. Solution 4, the city's choice, will prevent raw sewage from overflowing to the river and backing up into area basements.

Community water and sewer bills for the citizens of Glasgow are well above reasonably affordable levels as established by DOC affordability criteria. DNRC grant funding assistance in completing this project is critical to protecting Montana's renewable resources without causing excessive financial burden to its citizens.

Technical Assessment:

Background:

Combined sanitary-storm sewers in Glasgow have resulted in hydraulic overloading of the piping system resulting in frequent bypasses of untreated sewage to the Milk River and sewage back-ups into residences. DEQ strongly supports the correction of these problems and a public survey indicated that the residents believe that resolving the storm water problem should be of the highest priority. Because of the liability for damages, the city may lose its insurance coverage if the problem is not corrected.

Approach:

Alternatives are limited to expanding the sanitary sewer system or separating the storm water from the sanitary sewage with a separate collection system. The latter alternative was selected for construction. Necessary work was broken into two phases for funding purposes with this application for the first phase only. This work will eliminate the bypassing of raw sewage. The engineering report addressed the logical alternatives and selected the most cost-effective and environmentally sound option. Further discussion of subsequent project phases in the engineering report would benefit the overall project.

Administration:

The project would be directed by the City of Glasgow with assistance from a professional grant administrator and consulting engineer. Budgeted costs are realistic and the technical approach is sound. The report discussed the utilization of BMP's on the stormwater system which allows the new discharge to be exempt from the non-degradation requirements of the Montana Water Quality Act. It is not clear how these BMP's will be included in the project or at what expense. It appears the BMP's will be mandated by DEQ for this project and could be as simple as a detention basin or drainage swale. The project requires coordination with the DEQ Storm water Program and the DEQ State Revolving Loan Program.

Financial Assessment:

Project funding depends on DNRC funding, TSEP funding, CDBG funding, and SRF loan assistance, resulting in a total

project cost of \$2,048,000 and user cost increase of approximately \$4.40 monthly. The budget and spending plan are sound. Even with loss of grant funding, this project remains financially feasible. The financial plan did not specify if the SRF loan would be secured with revenue bonds or formation of a special improvement district.

Benefit Assessment:

The construction of a separate storm sewer system will result in overall benefits to the community and the environment. The removal of storm water from the waste treatment system will improve the performance of the lagoons by reducing hydraulic "flushing." The increased hydraulic capacity in the sanitary sewer system by the removal of storm flows will eliminate the bypassing of untreated sewage into the Milk River and reduce backups of sewage into residences. A special public meeting was held to discuss the project, and a survey was sent to the residents residing in the project area. Response showed strong local support for the project.

This project implements the policy objectives of the State Water Plan through development of water quality management plans.

Environmental Evaluation:

This project will not result in any long-term adverse environmental impacts. The project will result in the typical construction-related environmental impacts such as dust, noise, erosion, etc., which will be controlled through project specifications.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 38

Applicant Name: Meagher Conservation District
Project Name: Cottonwood Creek Watershed Rehabilitation

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 113,224	Landowner Contribution
	\$ 4,700	Project Sponsor
	\$ 7,404	Natural Resource Conservation Service
Estimated Total Project Cost:	\$ 219,527	
Amount Recommended:	\$ 60,306	

Project Abstract: (Prepared and submitted by applicant.)

Cottonwood Creek, a major tributary to the Musselshell River, has its origin high in the majestic Crazy Mountains. The first travelers to this remote region in Montana would have found a pristine, unspoiled mountain stream, teeming with wildlife and fisheries. Mankind and Mother Nature have not treated this drainage well. A series of events had a dramatic impact on Cottonwood Creek.

High timber prices resulted in heavy logging during the 1970s and again during the early 1990s. Unfortunately, the logging occurred in sensitive areas with the logging operations, road building, and clean-up resulting in heavy erosion. Mother Nature also dealt a cruel blow with two major forest fires; one during the 1970s and the last major fire during 1994. Floods occurring as a result of opening the forest canopy have created major damage to the downstream reaches. Streambank erosion has impacted fisheries and water quality. Floods have heavily damaged private property, public property (roads, bridges), and major irrigation structures. Only emergency repairs have been made to these areas. Damages from these floods are long term and will impact ranchers, recreationalists, and downstream users for years to come. The U.S. Forest Service completed a major land trade and has begun restoration work on the logged and burned areas.

The Meagher County Conservation District shares the concerns with the water users and, as a major advocate for conservation in Meagher County, feels responsible to take the lead in the restoration of this once pristine watershed. This grant will provide the restoration work that will again begin to make the area attractive for wildlife, fisheries, recreation, and economically viable timber and water resources.

Technical Assessment:

Background:

As a result of fire damage, extensive logging, and site-specific activities like grazing and the development of irrigation diversions, the Cottonwood Creek watershed suffers from a variety of problems that have caused excessive flooding and significant streambank erosion in some areas.

This application proposes to restore the watershed to a more natural condition through the improvement of irrigation diversions, development of spring and riparian pasture, streambank stabilization, and the relocation of a winter feeding area.

Approach:

Grant money would be spent in two primary areas: grazing management, and in-channel stream improvements, including streambank protection. Several expert reviewers expressed concern that the alternative analysis for the project needs further development.

A complete watershed evaluation proposed in phase 1 is integral to the success of this project. Without a complete assessment of the existing conditions of the watershed it is difficult to evaluate the need or effectiveness of the solutions proposed in the application. On the basis of expert, on-site review, it was determined that the irrigation diversions are creating the most significant adverse impacts on the lower reaches of the stream. Replacement of these structures would likely benefit the watershed. However, it is unclear from the information presented whether the proposed streambank protection is adequate or necessary.

The riparian habitat along Cottonwood Creek is in good condition and currently provides wildlife habitat and other

benefits of a healthy floodplain. The proposed riparian fencing would benefit the riparian habitat and reduce non-point source impacts in the watershed. However, the proposal does not offer adequate information on the grazing impacts in the watershed to determine whether the development of spring pasture will result in the benefits described.

The project also proposes to relocate a winter feeding area that currently concentrates cattle in a region along the creek, resulting in adverse non-point source impacts. The construction of feed bunks and an enclosure fence on the benchlands out of the immediate vicinity of the creek will benefit the resource.

The public information program proposed in phase III of the project is not sufficiently described to evaluate the potential success of the effort. The applicant did not provide any description of the content or method that would be used to implement the public information campaign. Additional efforts to implement the *310 - Streambed and Land Preservation Act* in the Cottonwood Creek watershed are necessary to ensure the long term success of the project.

Administration:

Meagher Conservation District will administer the project with the assistance of NRCS. This project involves coordination with private land managers and representatives from a variety of state and federal agencies. The Project sponsor has developed contact with all of the interested parties. The project sponsor will need to coordinate with state and federal representatives in order to secure the necessary permits for the proposed instream construction activities.

The proposed project schedule is sufficient to complete the grant phase of the proposal in the time presented.

Financial Assessment:

The project sponsor would contribute \$4,700 towards project administration, and NRCS would provide \$7,400 in administration and technical assistance. The landowner contribution is \$113,224. This amount is represented by a 75 percent grant, 25 percent landowner cost share for the diversion structures, relocation of the winter feeding operation, riparian fencing, and direct costs and indirect costs for development of the spring pastures.

DNRC recommends reducing the grant amount to cover the costs of those project phases with the most direct benefits to the watershed. All reviewers expressed the need to, improve the diversion structures, move the winter feeding area out of the riparian area, and complete the riparian fencing. The funding request for these components of the project, as requested, amounts to \$72,107.

The application contained a clerical error resulting in the overstatement of \$12,155 for the relocation of the winter feeding site. The adjusted total project cost as a result of this correction is \$219,527. This error further resulted in the overstatement of grant funded expenditures by \$5,801. Accounting for the clerical error of \$5,801 results in recommended grant funding of \$66,306.

Project success is contingent upon the participation of all identified private parties due to the high amount of landowner contribution required to complete the project. The participating parties have pledged support to the project, but have not committed financial support to each share of the project. The project is only financially feasible with the full participation of all project contributors.

Benefit Assessment:

This project has strong local support evidenced through letters of support from landowners participating in the project. However, DNRC is concerned that private individuals are the primary beneficiaries of the project benefits through the

development of capital and infrastructure improvements on private lands. The funding recommendation has been adjusted commensurate with the direct benefits to the resource that will most likely translate into long-term public benefits.

This proposal implements the policy objectives of the State Water Plan through its voluntary approach to remediation and prevention. Riparian restoration will have a positive impact on water quality and quantity. This project has the potential to increase and sustain instream flow if supporting measures are taken. The project employs watershed planning, is locally sponsored, and supports family owned ranches.

Environmental Evaluation:

The adverse impacts associated with the project are isolated and short term in nature. Impacts will occur as the result of installing diversion structures, rip rap, and fencing. The location for these activities are easily accessible so that any disturbance will be related more to the structure itself than the installation. One of the diversion structures could present some problems due to steeply cut and deep banks. The location of the structure will likely be determined in part by accessibility. If executed properly, adverse environmental impacts should be short term and minor. The DFWP should be contacted to determine if any endangered or threatened species could be affected as a result of the planned activities.

Recommendation:

DNRC recommends grant funding of \$60,306. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 39

Applicant Name: City of Fort Benton
Project Name: Irrigation and Community Forestry Rehabilitation Project

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 22,300	Signal Point Golf Club
	\$ 15,000	Donations
	\$ 32,500	Local In-kind

Estimated Total Project Cost: \$ 169,480

Total Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The beneficial land use of Fort Benton's public golf course and other adjacent land management uses are at serious risk due to diseased and dying trees, soil erosion, and an inadequate/deteriorating water irrigation system. Also at risk are the agricultural crop spraying services and aerial firefighting depot located at the Chouteau County Airport. These services use the same irrigation supply system to prepare aerial spray solutions and fire retardant mixtures.

The proposed project will: (1) repair and expand the existing irrigation system, (2) plant 430 trees of diverse species and age, and (3) construct a three million gallon holding pond. The plan has been reviewed and endorsed by DNRC, Forest Management Bureau.

The City of Fort Benton owns 82 acres, located 3 miles east of town on the bluffs, which are used by the public golf course, airport authority, Shep Memorial Foundation, Pheasants Forever Habitat, and the Fort Benton Trap Club. Thirty years ago when this area was developed, 725 single species trees were planted, which are now dying at a rapid rate. Disease and insect damage are accelerating this decline. In addition, the irrigation system servicing the area is both inadequate and deteriorating. In spite of previous private donations and volunteer efforts, the city has been unable to contain the tree loss damage or provide adequate irrigation system repairs and upgrades.

The resulting public benefit of this project will be significant. The public golf course serves Chouteau, Cascade, Hill, and Liberty counties, with a combined population of 103,000 persons. One hundred fifty farms in this four-county area are presently served by the Chouteau County Airport agricultural spraying business. The aerial firefighting depot provides protection for all the 2,444 farms and ranches in the four counties.

Technical Assessment:

Background:

The Signal Point Golf Course is a municipal facility owned by the city of Fort Benton. In 1968, 725 trees were planted on 50 acres. Since that time, 440 trees have died from disease and insect damage leaving only 285 trees. In 1993, a volunteer group began the process of designing and implementing a tree planting program. 97 trees have been planted and irrigated. This project would resume the tree planting project started in 1968. Expansion of the irrigation system would provide a water supply for additional tree irrigation, a public toilet facility at the golf course, and water supply at the Chouteau County Airport for agricultural spraying and fire suppression. A new eight inch supply line was installed to provide irrigation water to the project area this summer.

Approach:

The reforestation project consists of replanting 430 trees consisting of 15 different species. The trees are two to six years old and all of them were raised in the region to assure viability and hardiness. The irrigation system will be improved and extended to provide water through a timed bubbler system to all of the new plantings over a 50 acre area. The irrigation system will provide 40 gallons of water per week to each of the 430 new trees planted through this project.

The irrigation project includes the installation of a 2 inch off-line tap to the airport. The addition of a 1 inch supply line from the golf course irrigation system will provide irrigation capabilities to the Shep Memorial and adjacent pheasant habitat managed by the local chapter of Pheasants Forever, a private non-profit group devoted to habitat protection and development for upland game birds.

The project includes construction of a 3 million gallon holding pond that will be connected to the irrigation supply system to support agricultural spraying and fire suppression activities at the airport.

Administration:

The project will be managed under the direction of Skip Ross, Fort Benton Superintendent of Streets and Parks, and Bill Widman, Special Projects Chairman for the Signal Point Golf Course.

Financial Assessment:

Total cost of the project is \$169,480. Grant funded expenditures will cover \$28,590 for the irrigation system and \$71,410 for procurement and planting of trees. The project sponsor will cover the cost of project administration. The Signal Point Golf Course will provide \$3,845 for tree procurement and planting and contingency expense of \$10,385. The holding pond will be constructed for \$47,250 using volunteer equipment and a donated poly-liner. Professional expenses for the design of the system costing \$8,000 will be provided by the Signal Point Golf Course. The project budget is well developed and costs are justified.

Benefit Assessment:

This project will most directly benefit the recreationists that use the Signal Point Golf Course and the Shep Memorial. The construction of the 3 million gallon holding tank will provide public benefits regionally through improved agricultural spraying and fire suppression capability. The project has well documented citizen support. Visitors to the Shep Memorial will benefit from the landscape improvements resulting from increased irrigation. The adjacent pheasant habitat will also benefit from the irrigation improvements.

The project supports the policy objectives of the State Water Plan through the improvement and expansion of a water storage facility and support and protection for family-owned farms. Improved water use and conveyance efficiencies in municipal systems would result from development of the proposed irrigation system.

Environmental Evaluation:

No significant long-term adverse environmental impacts will occur as a result of this project. The project sponsor will need to secure all of the necessary permits from the appropriate state and federal agencies prior to undertaking any construction activities.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, budget, project administration, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 40

Applicant Name: Montana Dept. Natural Resources & Conservation - Forestry Division
Project Name: Fire Hazard Assessment GIS Project

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 9,564 Project Sponsor

Estimated Total Project Cost: \$ 109,564

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The Fire and Aviation Management Bureau of DNRC's Missoula office proposes to develop and implement the Western Montana Fire Hazard Assessment Geographic Information System Project in response to the 1996 DNRC Renewable Resource Grant and Loan Program. Increasing development on the west side of Montana's Rocky Mountains over the past decade has created a growing need for wildfire hazard mitigation, protection, and prevention. With the expanding state of the wildland/urban interface, Montana is experiencing an escalating fire hazard problem. Although wildfires are a natural part of the ecosystem in Montana, the potential threat to human life, structures, and natural resources is becoming critical as human populations encroach in greater numbers on areas of abundant and highly flammable wildland fuels. The proposed project will establish a Geographic Information System (GIS) to classify and map fire hazards in the wildland/urban interface areas west of the Montana Rocky Mountain Continental Divide. This system will be used to educate developers, planners, realtors, and landowners of the potential wildfire hazards faced by wildland residential developments and will provide information that will assist in planning and conducting fire prevention activities in these interface areas.

The wildland/urban interface is generally regarded as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Technical Assessment:

Background:

The project sponsor proposes to develop a GIS database and maps that will be useful in assessing fire hazard potential in wildland/urban interface areas of western Montana. By providing information that would indicate the areas with the highest potential for wildfire it is hoped that planners and developers would steer away from allowing or promoting construction in these areas. The proposal responds both to administrative rules that went into affect in Montana in June 1996 and to recommendations contained in an annex report submitted to FEMA following two 1994 fires in Lincoln and Flathead Counties.

The goal of the project is to devise a simple way to assess fire hazard potential based on a few indicators and then to input those indicators into a database that can be used with GIS to prepare maps of 40-acre segments. These maps would be made available to local planners.

Approach:

A simple means to assess fire hazard potential has been proposed based on pilot studies north of Missoula in the North Whitefish areas. Forty-acre segments would be assessed for slope, aspect, and fuel type with ratings from low to extreme. A database would be created with data gathered and maps would be produced. Reviewers expressed concerns that the proposed rating system was too simplistic. Fuel type categories specified in the proposal are broad and there could be greater variability of fire behavior within the category than between categories. Scientific basis for the weights assigned to variables needs to be documented in the development of a credible system.

More coordination with other natural resource agencies would strengthen the proposal and help to ensure valid results. In addition to contributing technical oversight, these agencies may already have valuable data that could contribute to the success of the project.

Administration:

The proposal does not provide adequate budget documentation. A detailed and fully justified budget outlining the work to be accomplished by a professional consultant should be developed. The proposal indicates that a contracted employee will be used to accomplish day-to-day task work. There is some concern that it would not be possible under current employment laws to hire a contractor in lieu of an employee.

Financial Assessment:

Total cost of the project is \$109,564. Grant funded expenditures will cover \$31,500 for project administration, which includes \$25,210 for a project coordinator. Professional costs amount to \$60,000 for a GIS consultant and \$8,500 for computer and software. The project sponsor will provide \$9,564 in match for administrative expense.

The project budget appears adequate but offered little justification for the costs identified. Several concerns are not addressed in the documentation presented. The budget includes \$6,000 for a pentium computer; this amount is high for a single computer and low for a GIS station. Alternatives to the purchase of new computer equipment should be examined. If none are viable, the purchase of computer equipment needs to be fully justified. In any case it has not been the policy of the grant program to purchase agency computer hardware; computer hardware should be provided as an agency match.

A consultant budget of \$60,000 is outlined in the proposal, but the tasks to be completed by a consultant have not been outlined. No discussion of the costs for maintaining the database after the completion of the project was provided.

Benefit Assessment:

The applicant does a good job of presenting measures for quantifying the results of the project on the basis of project goals and objectives. Principal beneficiaries are the many rural residents that live on the forest boundary. This project will help resource planners to more effectively implement strategies for fire hazard mitigation as communities grow into the border reaches of forestlands.

This project does not implement the policy objectives of the State Water Plan.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with this project.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 41

Applicant Name: City of Chester
Project Name: Water Treatment Plant and Storage System Improvements

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 417,000	TSEP Grant
	\$ 100,000	Sponsor's Water Reserves
	\$ 267,000	Local Revenue Bond
Estimated Total Project Cost:	\$ 884,000	
Amount Recommended:	\$ 100,000	

Project Abstract: (Prepared and submitted by the applicant)

This project addresses several needs identified in a study of the water system in Chester. The community currently does not meter its individual water users, has a low volume of water storage for fire protection, has an area of town which has water system pressures less than 20psi and has 25-year-old controls of its surface water treatment plant. The total cost to improve these components is estimated at \$884,000, which is above what the individual users can afford.

The installation of water meters and the updating of the controls and monitoring devices at the water treatment facility are two components that will have a dramatic affect on the amount of water consumed and the quality of the water produced by the town of Chester. The ratio of the minimum day use to the maximum day in Chester is nearly 10 which is 5 times the national average. This indicates that people are not using this resource wisely or efficiently. The use of water meters will help the town recover the costs to produce the water and will cause a reduction on the amount of water used. These two factors will greatly improve the operation of the existing water system. The new water storage reservoir will help increase the operating pressure in the western portion of town.

The installation of the new control/monitor system at the water treatment facility will help the town stay in compliance with the surface water treatment regulations. The upgrading of monitoring and record-keeping equipment will delay the need for an additional employee in the water department, but will still maintain the level of monitoring necessary to ensure a safe water supply. The financial assistance provided by a DNRC grant will help make this project feasible.

Technical Assessment:

Background:

The City of Chester water system services around 455 residential and commercial hookups. Users currently experience water shortages and inadequate pressures in certain areas of town, particularly the western portion. The town has discovered that it consumes up to two-and-a-half times more water than it should. The community's water treatment plant is 20 years old and is beginning to show signs of age. In particular, it is felt that the controls are outdated.

Approach:

The proposed improvements include installation of individual water meters, updating controls at the treatment plant,

installing a 200,000-gallon elevated storage tank, and replacing undersized mains with new 6-inch pipes. The goals of the project are to improve the water system to ensure that an adequate supply of water can be delivered at a usable pressure and to promote wise and efficient water use by the consumers.

Supporting technical documentation provided by the sponsor for the proposed improvements was limited and vague. Specific water mains to be replaced were not indicated, sufficient storage alternatives were not explored and an in-depth analysis of treatment controls was not presented. Although the proposed improvements will likely improve the water system, it is not clear that the identified problems will be solved. Installation of meters should significantly reduce the high water usage currently being experienced.

A more detailed analysis should be conducted and information provided regarding storage alternatives, particularly on grade and gravity flow. The applicant should also: provide a more thorough description of water treatment plant controls and specific areas needing immediate attention; conduct a hydraulic analysis of the distribution system and provide description of specific areas needing attention; and perform further research into estimated costs of water meter installations.

Administration:

The system is in violation of standards by virtue of instances where system operating pressures are less than 20 psi. It is unclear whether or not the proposed improvements will bring the system into compliance. The sponsor proposes a design meeting requirements of WQB-1. The town will be responsible for the operation and maintenance of the water meters, storage tank, and treatment facility. No discussion regarding land acquisition was presented. The schedule of construction in late 1997 or early 1998 appears realistic, taking into account DNRC and TSEP funding cycles.

Financial Assessment:

The proposed funding strategy for the \$884,000 project consists of a \$100,000 DNRC grant, a \$417,000 TSEP grant (1996 application has been made), \$100,000 in Chester water fund reserves, and implementation of a \$267,000 water revenue bond by the town. The project budget includes \$50,000 in administration costs, \$97,000 for engineering costs (\$20,000 DNRC), \$669,600 in construction costs (\$80,000 DNRC), and \$67,400 for contingencies. Project feasibility is contingent upon receipt of the TSEP grant and issuance of the water revenue bond.

The applicant states that the current average user rate of \$20.00 per month will increase \$5.10 to \$25.10 if all funding is attained. Without DNRC funding the rates will increase to \$26.10 per month.

Insufficient documentation was provided to verify the engineering estimates. Unit price numbers appear realistic, with the exception of those presented for water meters, which appear low. Based on the information presented, the project appears financially feasible, although there is a question as to whether or not some of the proposed improvements are the most cost effective.

Benefit Assessment:

The entire community will benefit from the proposed improvements. Additional storage will be provided, an improved control system will result in a more reliable treatment system, and water use should be reduced.

The project implements the policy objectives of the State Water Plan through improved water-use efficiency. The proposed improvements will encourage voluntary conservation by municipal water users (metering), and water-use and conveyance efficiencies will be improved without creating any adverse effects.

Environmental Evaluation:

Long-term adverse environmental impacts are not anticipated as a result of the proposed project. Short-term disturbances such as noise, dust, and vegetation disruption will likely occur during the construction period but should be tolerable if proper precautions are taken.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 42

Applicant Name: City of Thompson Falls
Project Name: City of Thompson Falls Water Supply Improvements I

Amount Requested:	\$ 100,000	Grant
	\$ 100,000	Loan
Other Funding Sources:	\$ 57,713	TSEP Grant
	\$ 4,250	City of Thompson Falls
Estimated Total Project Cost: \$ 261,963		
Amount Recommended:	\$ 100,000	Grant
	\$ 100,000	Loan

Project Abstract: (Prepared and submitted by applicant.)

The City of Thompson Falls is proposing to construct two additional wells in order to meet the maximum day demand. The maximum day demand is estimated at 975,000 gallons per day, based on current per capita water use and future population of 1,625 people. The city water system provides water from a combination of surface and groundwater sources. Currently the city relies primarily on surface water from Ashley Creek. During periods of peak demand, groundwater from two existing wells are used to supplement Ashley Creek.

The City of Thompson Falls has second water rights on Ashley Creek. This source is subject to primary water rights totaling 725 gallons per minute (gpm) which leaves the city a total of 295 gpm. However, this withdrawal is dependent on creek flows and currently does not provide adequate volumes for maximum use during periods of peak demand.

The city utilizes wells during peak demands for water. Well 1 is capable of pumping 650 to 700 gpm, while well 2 is capable of pumping 300 to 350 GPM. Well 2 is relatively shallow and it must be treated as a surface water. DEQ requires wells drawing water from table aquifers within 25 feet of the surface to receive continual disinfection with a 30-minute chlorine contact time prior to reaching the first user. In order to meet these requirements the city would need a separate water main from the distribution system.

The city must be capable of meeting the average daily water demand if the largest source is out of service. In the event the larger well is out of service when Ashley Creek flow is diminished, the average daily demand can not be met.

This proposal would benefit approximately 650 services or 1,500 users and is necessary in order to ensure average daily demand for water users.

Technical Assessment:

Background:

The City of Thompson Falls desires to add another well to its water supply system to ensure that average and maximum daily demands are met. This water system improvement project consists of the construction of an additional well near the city's two existing wells, a new pump house, and some minimal water line replacement. The water system presently consists of one surface water supply (Ashley Creek), and two wells. Ashley Creek is subject to flows as low as 150 gallons per minute during the year. Well 1 is only 20 to 25 feet deep and considered to be an unchlorinated groundwater source (of 350 gallons per minute); and well 2 provides water (approximately 650 to 700 gallons per minute) that is high in manganese.

During the low-flow periods of Ashley Creek, average day demand can not be met if well 2 is out of service. Well 1 requires chlorination with 30 minutes of contact time if it is to be a viable water supply. The City of Thompson Falls' water distribution system suffers numerous leaks which increases the average daily demand from 192 gallons per minute without leaks to 467 gallons per minute with leakage included. Including leakage, maximum daily demand is 952 gallons per minute and cannot be handled by well 2 and Ashley Creek (during its low-flow period).

Approach:

Solution alternatives considered were: (1) drilling wells at Ashley Creek and east of the city limits; (2) obtaining additional water rights on Ashley Creek; (3) obtaining water from the Clark Fork River; and (4) obtaining water from Blue Creek. Each of these alternatives was analyzed in sufficient detail to substantiate that alternative 1, drilling new wells, is the most cost-effective solution. However, correction of the water system's major leakage problem through water main replacement will reduce the required water demand and make it easier for the existing water supplies to meet user demands. Prior to expending funds to increase the water supply, the water lines should be repaired. Then if additional water is still needed, funding should be provided to increase the water supply (see Project No. 30).

Administration:

Sufficient technical documentation exists to show that adequate water quantity should be obtained from a new well drilled at the existing well site. The water quality of the new well is expected to be similar to that of existing wells 1 and 2. According to the city's engineer, the city is aware that the new well will most likely provide water with a high level of iron and/or manganese. There remains a question of whether groundwater at the proposed well site is adversely impacted by an old dump site located approximately 650 feet away. Before the new well is drilled, DEQ and EPA should approve the site.

Financial Assessment:

The City of Thompson Falls hopes to receive a \$200,000 grant/loan combination from DNRC and a TSEP grant in the amount of \$57,713. In-kind contributions from the City of Thompson Falls are estimated to be \$4,250 for this proposed project. With that contribution in conjunction with DNRC and TSEP funds, the city will have \$261,963 with which to

fund their project. Both DNRC and TSEP funds are necessary to complete both the proposed well and its pumphouse.

All costs seem to be included in the budget, and the engineer's construction cost estimate appears to include all items necessary for well and pumphouse construction. Annual operation and maintenance costs are not expected to change as a result of this project. Although no documentation was provided for the construction costs, the line items appear to be reasonably priced and the application indicates that the engineer based these costs on current standard fees for like services.

It should be noted that the City of Thompson Falls has a separate, second DNRC application under review at this time for its proposed water distribution system improvements. While the two applications address different system components, they are related by their common goal of providing the residents of Thompson Falls with more water. This project would increase the amount of water supplied, and the other project would decrease the amount of water lost through system leakage.

Benefit Assessment:

The proposed well development project would assure that the city's water system meets its average and maximum daily demand requirements. The project has good citizen support as evidenced by minutes from local meetings and the results of a community needs assessment. The community is clearly tired of water-use limits during the low-flow periods on Ashley Creek and the manganese problem associated with existing wells. The city engineer has indicated that the community is aware that a newly drilled well will likely have an iron and/or manganese problem similar to that of the existing wells that will stain clothes and plumbing fixtures. The water system master plan proposes treatment for iron and manganese removal in its long-range plans.

The "Drought Management" section of the State Water Plan is indirectly implemented by this project since the proposed new well will improve water-use efficiency and increase water supply security. It also promotes the conjunctive use of surface water and groundwater, which helps support sustainability in the management of water resources. The proper abandonment of Well 1, as proposed under this project, contributes towards water quality protection by helping to protect the local aquifer from contamination.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of this project. All construction will occur within areas already disturbed. Temporary problems with noise and dust will occur during the construction phase of the project. Before the new well is drilled, DEQ and EPA must approve the site to ensure that the old dump nearby is not adversely affecting the groundwater there.

Recommendation:

DNRC recommends grant funding of \$100,000, and loan funding of up to \$200,000. Grant and loan funds for the project will be available after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 43

Applicant Name: City of Ekalaka
Project Name: Water System Improvement Project

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 248,000 Rural Development Grant/Loan
\$ 6,000 Project Sponsor

Estimated Total Project Cost: \$ 354,000

Amount Recommended: \$ 41,000

Project Abstract: (Prepared and submitted by applicant.)

The proposed water project would correct several deficiencies with the Ekalaka water system. The primary concern is related to water supply (the wells), but several other improvements are required to bring this water system up to state standards and allow it to provide proper water supply to the residents of Ekalaka.

Ekalaka has one good well (well 3). Four other wells exist on this system, only one of which is being used as a backup well. Problems exist with both quality and quantity. The backup well (2) is a 50-year-old well and is much more highly mineralized than the other wells. Well 4 is available for use but contains H₂S gas and therefore is only used in emergencies. Well 5 can produce in excess of 200 gpm, but it delivers sand and therefore has not been used in recent years. Well 6 was drilled in 1994, but it has both quality and quantity problems. The goal of this project is to rehabilitate three of the four backup wells so that they will be a dependable source of high quality water.

Improvements to the telemetry system on the wells will be made and the deteriorated well houses for wells 3 and 4 will be replaced.

There are two 100,000-gallon gravity storage tanks on this water system. One of these tanks is more than 60 years old, while the other one was constructed in 1994. The two tanks together adequately meet storage needs for fire protection plus normal usage. Rehabilitation of the piping and valving at the base of the old tank is required to allow it to be properly isolated and flushed. There is evidence that this tank leaks. This must be repaired to prevent further damage and to conserve water. Two other improvements are the installation of approximately 30 curb stops and approximately 15 meter pits on certain services. This will help curb the use of unaccounted-for water and provide important controls on service lines.

Technical Assessment:

Background:

The City of Ekalaka has one good well (well 3) and four other wells (wells 2, 4, 5, and 6) that each have their own unique problems. This project proposes to upgrade three of the four backup wells so that the town will have a sufficient water supply. Well 6 was drilled in 1994 with DNRC and RD funds, but did not provide adequate water quantity. Well 4 has taste and odor problems caused by hydrogen sulfide (H₂S) gas. Well 5 is a high-yielding well, but it pumps sand. Well 2 is a 50-year-old well with a high level of total dissolved solids in the water.

In addition to the problems with the wells, the two existing 100,000-gallon water storage tanks require some minor repairs. Well houses 3 and 4 need some improvements and it is proposed that well house 2 be moved to well 5. The auxiliary power supply for well 3 is inoperable and needs to be replaced. In addition to the problems listed above, the water system also has some minor telemetry and metering needs.

The primary goal of this project is the upgrade of Ekalaka's well, storage, and distribution facilities to make them more dependable and to provide a higher-quality water with reduced operational costs. Specifically, the project objectives are: (1) the elimination of water quality problems with wells 4, 5, and 6; (2) the improved development of well 6; (3) the upgrade of well houses 3 and 4 and the provision of auxiliary power for well 3; (4) improvements to both water storage tanks; and (5) the installation of meters and curb stops where they are needed on the water distribution system.

Approach:

The proposed water system improvement project was prompted by the City of Ekalaka's dissatisfaction with its new well 6 and its desire to fix the well's problems, but the proposal also includes many other maintenance items for its water system. The project will meet the City of Ekalaka's goal of a more dependable water system and appears to incorporate the best alternatives considered. However, no consideration was given to the option of addressing the proposed improvements systematically over a period of time with operation and maintenance funds. The broad scope of the project attempts to correct all apparent system deficiencies with grant funds at one time. In addition, it appears that only two (rather than three) wells need to be renovated in order for DEQ well-quality standards to be met.

Rehabilitation of three existing wells would provide the town with a greater quantity of higher-quality water. The success of each proposed well renovation is dependent on well and aquifer conditions revealed at the time of drilling. In particular, there is no guarantee that with the deepening of well 6, another productive water-bearing lens can be located and developed. It is also possible that a rehabilitated well 6 may be productive enough to eliminate the need for the other well rehabilitations.

Administration:

No legal hurdles exist to hinder project development and no special permits, other than DEQ plans and specifications approval, are necessary for implementation of this project. The City of Ekalaka would administer the grant and procure all services and materials.

Financial Assessment:

The City of Ekalaka is requesting \$100,000 from the DNRC in the form of a grant, \$248,000 in a grant/loan combination from the USDA Rural Development Program (RD), and is contributing \$6,000 of its own resources toward the proposed \$354,000 project. Availability of funding through the RD Program is unknown at this time.

The primary motivation for this application is the City of Ekalaka's desire to complete the construction of well 6, which was drilled two years ago using DNRC and RD funds. The remaining scope of the proposed project consists largely of maintenance items for Ekalaka water system components that could be kept in good repair under a regular operation and maintenance program. Once well 6 is completed and its quantity determined, the town can better assess the necessity of improvements to its other system wells. The cost of completing well 6 is \$41,000, based on a cost of \$34,000 for the rehabilitation, 15 percent for engineering costs, 5 percent for administrative costs, and a 10 percent contingency.

Benefit Assessment:

The proposed project includes the metering of 40 currently unmetered water services, thus encouraging water conservation. The plugging of well 2 will protect groundwater from potential contamination between aquifers and from the surface. Although there is no documented citizen support, it is evident from the application that the community desires higher quality water and that local ranchers and state and federal agencies rely on the public water supply for their needs.

This project indirectly supports the policy objectives of the State Water Plan as stated in the "Drought Management" section. The proposed installation of meters and the improvement of water conveyance by system rehabilitation would improve water-use efficiency and protect the groundwater resource.

Environmental Evaluation:

No significant adverse environmental impact will occur as a result of this project. All construction will occur within Ekalaka water system right-of-ways and at existing water system components, and no new areas will be disturbed. The only expected adverse impacts are temporary disruption of air quality and noise during construction. As part of its plans and specifications review, DEQ would complete an environmental assessment.

Recommendation:

It is recommended that the City of Ekalaka receive a grant in the amount of \$41,000, based on a cost of \$34,000 for the rehabilitation of well 6, 15 percent for engineering costs, 5 percent for administrative costs, and a 10 percent contingency.

Although the City of Ekalaka is requesting a DNRC grant of \$100,000 and has a total project cost of \$354,000, it is felt that DNRC should assist only in funding the rehabilitation of well 6 at this time since it was originally constructed using DNRC funds and should be fully completed. The other proposed water system improvements are generally maintenance items that can be addressed by the town over time through its operation and maintenance budget. The need for the other well rehabilitations can be better assessed once the capacity of well 6 is determined. Before DNRC awards a grant to the City of Ekalaka for improvements to well 6, the town must provide adequate documentation that it has accepted the existing condition of well 6 and is not pursuing legal recourse with any parties involved in its original construction.

Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

Project No. 44

Applicant Name: City of Roundup
Project Name: Lagoon Improvement

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 400,000 CDBG Grant
\$ 500,000 TSEP Grant
\$1,391,187 Revenue Bonds

Estimated Total Project Cost: \$2,391,187

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

This project consists of the construction of a new aerated wastewater treatment facility and replacement of the collection line extending from 2nd Avenue (along the eastern edge of town) to the new treatment facility. The new facility would be located north and adjacent to the existing lagoon, on property owned by the city. The new treatment facility will eliminate recent hydraulic overloading of the present lagoon, high sodium content of wastewater, seepage of present lagoon bottoms, and sludge accumulation. Action must be taken immediately to avoid damage to the environment and endangering the health and safety of the general public. Collection line reconstruction is included because of its current deteriorated condition. It is also well below state WQB-2 minimum slope standards and will need to be replaced to properly service the new treatment facility. The collection line reconstruction will occur on the existing city easement.

The City of Roundup is presently spray irrigating adjacent farm land from the present lagoons to control hydraulic overloading. That method is considered a short-term solution because the relatively high salinity of city water introduced to this type of soil over a long period of time can cause degradation of the soil structure and render the soil impermeable. The high water levels are causing concern. The possibility of a dike breach is possible during high runoff periods. Such an occurrence would be detrimental to the water quality of the Musselshell River, which is very close to the lagoon site. Seepage through the existing lagoon floor presents a risk to groundwater levels that are dangerously close to the lagoon floor, perhaps within two feet during months of high groundwater levels. These conditions are a risk to municipal, recreational, and agricultural users near the site and downstream from the present facility, including the towns of Musselshell and Melstone.

Technical Assessment:

Background:

The existing wastewater treatment lagoon is leaking significant amounts of wastewater to underlying groundwater and surface water. The high water levels in the lagoon could threaten the structural stability of the dikes, leading to possible failure. A dike failure could result in a severe environmental and public health threat through the uncontrolled discharge of millions of gallons of wastewater. A new wastewater system is clearly needed to address these problems.

The existing lagoon does not adequately retain the accumulated wastewater flows, resulting in the need for an emergency

discharge by spray irrigation to avoid topping the dikes. The high salinity of the treated water limits the use for irrigation. The consulting engineer is proposing a system which discharges to the Musselshell River. DEQ has advised the city that the overloading of the lagoon is a serious problem and that progress toward resolving the problem must be made in the next year. This project, if funded, should be contingent upon providing a facility that addresses the long-term needs of the community, including all probable MPDES permit conditions.

Approach:

The consultant for this project has suggested that the existing total containment lagoon system be replaced with a new, three-cell aerated lagoon discharging to the Musselshell River. The limits of the proposed new MPDES discharge permit, issued by DEQ, suggest possible ammonia toxicity and fecal coliform limit for any new discharges. DEQ did not have adequate data to provide specific numerical limits for the permit prior to project implementation.

Considering the expense and long-term nature of the proposed project, further investigation of the possible conditions on the discharge permit is necessary prior to project implementation. The system proposed does not have facilities to disinfect the effluent and may not be capable of meeting an ammonia limitation. A more thorough alternatives analysis is needed to consider permit limitations as a condition of the project.

Administration:

The project and system will be administered by the City of Roundup. Budget for the facilities described in the application is adequate but will not cover the additional expense of new treatment processes, if needed. The applicant should coordinate the project with the DEQ State Revolving Loan Program to utilize loan assistance on favorable terms.

Financial Assessment:

The total project costs are estimated to be \$2,391,187, resulting in a sewer rate of approximately \$21.30 per month. Grant funds equivalent to \$1 million (42 percent) of the project costs have been requested. The remaining local share would be generated through the issuance of debt secured by revenue bonds. The city should investigate the SRF program, which has ample funds available and could reduce user costs by approximately \$2.00 per month. Costs could significantly increase if water quality standards result in the need for ammonia removal and effluent disinfection. A combined water-sewer rate was not provided in the application.

Benefit Assessment:

This project will reduce leakage of partially treated wastes to underlying groundwater and seepage to surface waters. Local officials have placed a high priority on this project and the public will benefit through the construction of a safe and reliable treatment facility for the community.

This project implements the policy objectives of the State Water Plan through efforts to protect the beneficial uses of groundwater and surface water.

Environmental Evaluation:

A new lagoon discharging to the Musselshell River has the potential of creating toxic conditions if ammonia levels are too high. Bacterial concentrations must also be controlled to prevent unsafe conditions in the stream, after mixing. This existing system as proposed may not be able to comply with these discharge limitations unless additional unit processes are added to increase treatment levels. The project would alleviate the concern about the failure of the existing lagoon

and solve the problem of irrigating with water containing high levels of sodium.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices in the design and construction/execution of this project.

The project engineer needs to investigate potential effluent limits of the MPDES discharge permit for requirements that may result in additional or different treatment processes.

Project No. 45

Applicant Name: City of Livingston

Project Name: Livingston Open Space Conservation Initiative

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 30,000 Montana Conservation Corp

Estimated Total Project Cost: \$ 130,000

Amount Recommended: \$ 27,000

Project Abstract: (Prepared and submitted by applicant.)

The Livingston Open Space Conservation Initiative will help to maintain critical natural resources within the Livingston Planning area. Through conservation projects on properties owned by the city, and voluntary partnership programs with private landowners, wildlife habitat will be protected, priority open space maintained, and recreational opportunities enhanced.

Livingston residents have consistently voiced their support for conserving the natural values that make this community an outstanding place to live. These include the Yellowstone River and its biologically rich riparian corridor, open rangeland, and other undeveloped areas. These sites provide wildlife habitat, and recreational opportunities, and preserve scenic vistas. This support for resource conservation is reflected in the Livingston Comprehensive Plan, which calls for the protection of open space and the Yellowstone corridor. Recently city council approved a policy for reinvesting proceeds from the sale of city land back into the preservation of open space and maintenance of existing parks.

Technical Assessment:

Background:

This project seeks to implement an open space ordinance adopted by the Livingston City Council. This ordinance directs that a portion of the proceeds from the sale of city lands be used to secure additional open space or maintain existing parks

and open areas.

The goal of the project is to preserve open space and restore riparian habitats in the Livingston area to benefit both humans and wildlife. This will be accomplished through the development of an open space inventory and plan and through public outreach to explore voluntary conservation measures. Habitat restoration activities and development of a park will be implemented on lands currently owned by the city.

Approach:

Creation of an open space plan and public outreach to encourage voluntary conservation measures is a primary objective and is measurable. More discussion of the planning process that would be employed to implement this phase of the project would be helpful in evaluating the potential success of the planning and outreach effort. Approximately 24 percent of the project funding is devoted to the planning and outreach phase of the project.

Habitat restoration and park development comprise the lion's share of the project effort. Although a planning component is involved in this phase of the project, the application does not offer any detail with respect to how these lands were identified, the condition of the property, or the restoration activities the sponsor intends to undertake. Without this information it is impossible to determine whether the objectives of this phase are well founded, measurable, or feasible given the proposed budget.

This proposal has only reached the conceptual stage. Without further development it is impossible to evaluate the technical feasibility of the project. The protection of open space is achievable and the potential benefits to the environment and the community are significant. However, without a more detailed proposal with well-developed alternatives, DNRC is not confident that project funding will result in completion of the stated objectives or the realization of the benefits claimed.

Administration:

The project would be administered by the City of Livingston in coordination with a variety of private and public agencies. Successful project implementation appears dependent upon coordination with the Gallatin Valley Land Trust, a private, non-profit organization.

On the basis of conversations with expert reviewers, the schedule for phase I of the project is very ambitious. The process of completing a thorough resource assessment is involved, costly, and painstaking. To complete this phase while implementing phase 3 will require thorough project organization but is not insurmountable.

The application does not provide sufficient detail to determine compliance and permitting requirements associated with the proposed activities.

Financial Assessment:

The total cost of the project is \$130,000 with \$30,000 in match funding from the Montana Conservation Corps and \$100,000 in grant funding. The project sponsor has pledged \$10,000 to the project in in-kind contribution for project administration, but these funds are contingent upon the sale of city-owned lands.

Phase 1 of the project is budgeted at \$15,000 to conduct an open space inventory and development of an open space plan. The applicant did not provide any indication of how these costs were derived.

Phase 2 of the project earmarks \$12,000 for plan implementation, and public outreach. This phase of the project will offer some opportunities for pursuing voluntary and incentive-based methods of open space preservation. On the basis of expert review, there is concern that this amount is insufficient to implement the objectives of this phase of the project. The limited budget for these activities precludes opportunities for fee simple purchase of targeted lands. It is estimated that the process of entering into an agreement for a conservation easement would cost between \$2,500 and \$4,000. With only \$12,000 budgeted for plan implementation and public outreach, this phase will not go very far toward the acquisition of conservation easements of lands identified through the planning effort. Furthermore, there is no mention of funding for stewardship activities once agreements for open space are negotiated.

Phase 3, the construction and restoration component of the project, comprises the majority share with \$69,000 in grant funds and \$30,000 in match funds earmarked for these efforts. This phase of the proposal has undergone only the most rudimentary planning.

Benefit Assessment:

The importance of preserving lands for open space is recognized through a variety of federal, state, local, and private programs throughout Montana and the United States. Riparian lands in the Livingston area and throughout Montana are succumbing to the pressures of the growing human population at an ever increasing rate. Development in these areas is resulting in the loss of wildlife values through reduced riparian habitat. Development within the river corridor reduces riparian function, increases threats of flooding, and threatens water quality. A well-executed open space and park restoration program would conserve land and water resources to the benefit of the local population.

Public support for the project is evidenced by the fact that the City of Livingston's Comprehensive Plan calls for the protections of green-ways and the Yellowstone River corridor. The city has passed an ordinance that dedicates a portion of the proceeds from the sale of city lands to this effort.

Environmental Evaluation:

The project is broken up into three phases. Phases 1 and 2 are primarily planning and outreach efforts with no associated environmental impacts. Phase 2 does include land acquisition. However, because land acquisition is for open space, these activities will result in the preservation of the current status quo. There should be no adverse environmental impacts associated with this activity.

Phase 3 of the project is for park development and restoration. The project sponsor has not submitted plans detailing this activity in anticipation of a comprehensive planning effort upon grant award. A resource inventory and scoping for potential impacts will need to be conducted as part of this planning effort. The planning period will present the opportunity to design mitigation measures for adverse impacts resulting from activities associated with park development.

Recommendation:

DNRC recommends grant funding of \$27,000. The \$27,000 recommended will cover the costs of the proposed open space planning and citizen outreach activities. The remaining \$73,000 in grant funds requested would cover the costs of activities associated with riparian restoration and park development of existing city lands. This phase of the project is not sufficiently developed to warrant grant funding at this time. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 46

Applicant Name: Yellowstone County
Project Name: Alkali Creek Streambank Stabilization and Park Landscape

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 80,000 Metra Park

Estimated Total Project Cost: \$ 180,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

This project takes a little different approach by focusing on issues outlined in the State Water Plan. This streambank stabilization and streamflow restoration project addresses the following issues: (1) cumulative impacts on water quality; (2) non-point source pollution impacts and monitoring to determine the effectiveness of water resource management (currently there is no comprehensive system in place for monitoring, so this project might serve as a demonstration model); and (3) administrative coordination by integrating water resource management practices that improve water quantity and quality in Montana.

This Yellowstone County project will preserve and protect a “healthy” riparian area alongside Alkali Creek. This area already supports many water-loving plants such as willow, cottonwood, cattails, and slough grass. Reduction or removal of these natural vegetated grounds would cause increased streambank erosion and water quality degradation. Preserving or protecting the lush riparian areas and wetlands in our state will accomplish the following:

- (1.) Slow flood flows, thus reducing erosion as well as property loss.
- (2.) Secure food and cover for fish, birds, and other wildlife.
- (3.) Keep water cooler in summer and prevent ice damage in winter.
- (4.) Prevent or reduce water pollution by filtering out sediment, chemicals, and nutrients from runoff.
- (5.) Provide important breeding habitat for birds and other wildlife.
- (6.) Hold more water in the soil, slowly releasing it for longer season streamflows and groundwater recharge.

The \$100,000 requested will assist in preserving the quality of Montana's land, water, fish, air, wildlife, and renewable recreational opportunities. Benefits will be experienced by more than 600,000 persons who either reside in Montana or visit the state. The project area is located on the northwest corner of MetraPark property and consists of land bordering Alkali Creek, its waterfall, and the southwest bank of the Yellowstone River.

Technical Assessment:

Background:

The goal of this project is to protect a natural area along Alkali Creek and develop the recreational values adjacent to the stream. This project would implement the MetraPark’s Master Plan, and the project is a component of the trail system that connects to other trails in the area.

Approach:

The project would implement the goals of the master park plan through the design and development of landscaped areas bordering the Alkali Creek drainage; construction of recreational trails in the watershed; and utility relocation and rock excavation to maintain the gradients along the banks of Alkali Creek.

This project would develop the recreational value of an otherwise under-utilized region of MetraPark through a combination of landscaping and trail construction. The project is presented as a streambank stabilization project with the intent of improving water quality in Alkali Creek. However, the project does not provide any documentation of existing water quality or erosion problems in Alkali Creek or how the project would address those problems.

Administration:

Coordination will be accomplished by MetraPark staff. A professional engineer will be hired to oversee all technical design work and project construction. The budget and schedule were prepared by a consultant and the landscape design would be accomplished by the same consultant. The project would be completed over 12 months.

Financial Assessment:

Total cost of the project is \$180,000. Of the \$100,000 requested in grant funding, \$8,650 would be used for project administration; \$13,000 would cover professional and technical expenses; and \$78,350 would be used for construction costs. The project sponsor will provide \$80,000 in match funding. The project budget is well developed and all costs are justified direct project costs.

Benefit Assessment:

This project will most directly benefit the recreationalists that use MetraPark through development of under-used park resources adjacent to Alkali Creek. The project would develop the recreational value of the riparian area adjacent to Alkali Creek. The project would also promote development of the regional trail system. Benefits are also claimed for riparian maintenance and associated water quality maintenance. The application does not provide sufficient evidence to substantiate these claims.

The project would implement the objectives of the State Water Plan through protection of the riparian zone. The concept is sound, but the problem in need of remediation is unclear.

Environmental Evaluation:

No significant long-term adverse environmental impacts will occur as a result of this project. The project sponsor will need to secure all of the necessary permits from the appropriate state and federal agencies prior to undertaking any construction activities.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 47

Applicant Name: Fort Peck Rural County Water District
Project Name: Fort Peck Rural Water System Development

Amount Requested: \$ 36,000 Grant

Other Funding Sources: \$ 3,000 Project Sponsor

Estimated Total Project Cost: \$ 39,000

Amount Recommended: \$ 36,000

Project Abstract: (Prepared and submitted by applicant.)

The residents of the Fort Peck Rural County Water District have an urgent need for a reliable water supply system. No public water system currently serves the district and groundwater sources are not potable. Residents currently haul their water from the town of Fort Peck or directly from the reservoir. Hauling water is not only a severe hardship, it is also unsanitary. Trucks used to haul water consume a non-renewable resource.

The 24,160-acre water district is located in southern Valley County near the town of Fort Peck. The southern portion of the district is bordered by Fort Peck Reservoir, constructed as part of the Pick-Sloan Missouri Basin Program. About 562 people live in the district, with planning for a population of 744. Development of this drinking water supply project would not only provide water to 744 people, but also to 3,000 cattle, to the partially developed Army Corps of Engineer's campgrounds, and various commercial operations that are within district boundaries. More than 280,000 people per year visit the Corps' facilities and area recreation facilities.

The absence of a municipal, rural, and industrial water system has discouraged population and economic growth in the district. Groundwater in most of the district is of poor quality and limited in supply. Approximately 95 percent of the residents haul all their water from Fort Peck Lake or the City of Fort Peck to meet domestic needs. The remaining 5 percent use groundwater but still haul small quantities of water for drinking. The Fort Peck Reservoir is seen as the best water source for a municipal water system. The reservoir water is considered to be of good quality, requiring only conventional treatment.

The 1994 final engineering report included an "environmental report" to evaluate each alternative presented for potential environmental impacts. The total impact for all of the alternatives was considered to be relatively minor and temporary. From the 15 alternatives evaluated, Alternative IIIB was selected as the recommended plan. This plan would provide a fully pressurized water system to all residents of the water district.

The capital and life-cycle costs for Alternative IIIB are estimated at \$5,708,000 and \$6,826,000, respectively. Life-cycle costs represent the total cost of a system, including capital, operation, maintenance, and replacement costs over a period of 40 years. A minimum funding support of 75 percent of capital costs is necessary to develop the water system. The user rates, including construction and operation and maintenance costs, would still be \$83/month even with this support.

Technical Assessment:

Background:

In 1993, the RRGL program funded a preliminary engineering report to identify the preferred approach to providing a domestic water supply to the rural area south of Glasgow and north of Fort Peck Reservoir. In 1995, the district requested and received a \$30,000 DNRC grant for the purpose of funding efforts to obtain federal funding for a regional water system. Efforts during 1995 and 1996 have been successful in obtaining authorization from Congress for design and construction. It is anticipated that the district will incur additional costs in pursuing appropriation for the expenditures.

Approach:

The goal of this grant is to compensate the district for travel and other expenses that it will incur during the funding procurement phase of their project. These costs include travel and engineering consultant costs, and the cost of employing the services of a lobbyist and advisor in Washington, D.C. The process of obtaining federal authorization has proven to be expensive.

The district intends to make periodic trips to Washington, D.C. to attend congressional hearings concerning the appropriations for the authorized regional water system. The district representatives would include a consultant engineer to provide technical information. While in Washington, D.C., the district will meet individually with Montana's congressional delegation and other key legislators. Meetings will also be scheduled with federal agency officials. The district's efforts have benefitted greatly from the services of a Washington, D.C. based lobbyist. A constant presence during the appropriations process permits quick interaction between the district and members of Congress.

Administration:

The Fort Peck Rural County Water District will coordinate project administration.

Financial Assessment:

The district is incurring costs in obtaining funding for the construction of a regional water system. It proposes to contribute \$3,000 of the estimated \$39,000 required to obtain the appropriation for system design and construction funding. The budget presented in the application addresses in general terms what expenses will be incurred. Much of the budgetary information in the application is based on costs that have occurred during the past two years. Included are estimated costs for travel and a lobbyist who works on an hourly basis as required. Travel costs are for district board members and a consulting engineer. The application does not include information pertaining to current user fees or affordability data.

Benefit Assessment:

The development of a regional system will support agriculture in the area and will enhance public health by providing a source of treated drinking water. The project is dependent upon federal funding. Anticipated water rates vary from \$31.00 per month to in excess of \$200.00 per month, depending upon the amount of state and federal funding. Congress has authorized federal funding for up to 75 percent of the cost of final engineering and construction. The benefits of constructing a water system in this rural area will not occur without the federal appropriation to design and construct the system.

If funding efforts are successful, the regional water system constructed will support the State Water Plan by enhancing

the general welfare of the people of Montana, contributing toward drought management, and generally improving water use efficiencies.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of this project. The environmental impacts considered in the application are for the actual project. With the exception of temporary construction-related impacts, the project will provide positive long-term benefits. Prior to initiating construction activities, a federal agency will prepare an environmental assessment. State agencies will participate in this review and try to coordinate activities so that all state and federal environmental laws are satisfied.

Recommendation:

DNRC recommends grant funding of \$36,000, the total amount requested. Grant funds for the project will be available after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 48

Applicant Name: Yellowstone Conservation District
Project Name: Watershed Planning in Montana Integrating Geospatial Information

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 5,674	Yellowstone Conservation District
	\$ 2,000	Yellowstone County
	\$ 72,146	Federal Agencies
	\$ 20,180	State and Local

Estimated Total Project Cost: \$ 200,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Geospatial information systems are a technical scientific tool used to collect, monitor and assess complex databases. It is also a non-technical information resource, much like a public library. Such systems can make issues clear and understandable through the development of computer generated maps that display the relationship between spatial and tabular data.

Geospatial and coordinated natural resource planning committees and task forces created by the Montana legislature and federal, state, and local governments have all identified the need for inter-agency collaboration in the development and use of this technology for land use planning in Montana. One of the identified obstacles to implementing and strategically planning for the growth of geospatial information systems in Montana is the need to establish a statewide framework--including data sharing, data coordination, data access, data collection, and data management. This project is designed to address these and other related issues. The conservation district will field test a geospatial planning prototype in a

watershed area in the Greater Yellowstone Region.

The geospatial prototype was created by a team of federal and state land planning agencies, lead geospatial researchers from Montana's universities, city and county planners, and private citizens and planners involved in local watershed planning. Implementation of the prototype will establish Montana's first comprehensive geospatial based watershed planning effort that connects environmental, social, and economic information and makes it accessible to local decision makers through a standardized geospatial information system framework. After field testing, the model will be revised to reflect actual field experience and demonstrated to other planning groups in Montana.

Technical Assessment:

Background:

The project is proposed to develop GIS capability at the local level. If successfully implemented, it could provide local, state, and federal officials with a better understanding of how natural resources are spatially related in watershed areas. The information could be used in watershed planning efforts. An impressive effort went into the formation of the technical oversight committee that helped define the proposal.

The benefits that would occur as a result of the proposed project are unclear because the project has not been fully developed yet. The actual scope of the project, the data to be collected, and the application of the data collected is still on the drawing board.

Approach:

The project sponsor expects to develop a basic GIS strategy and a handbook that would be useful for people wanting to use GIS for community planning. But there is a considerable amount of equipment being purchased to gather data in the Greater Yellowstone area and as yet there has been no specific proposal for using the data gathered.

Unless more definition is given to the project scope, its goals and objectives, and a more detailed budget with actual commitment of matching funds, it is not clear that the benefits would outweigh the costs. Reviewers were enthusiastic about the project in general but felt that the proposal was not adequately developed and appeared premature. The chief weakness in this proposal is that no particular problem or need is identified. The project sponsor views GIS as a tool that could be used as a planning tool and thus wants to build capability so that it will be available in the future. The focus is on the usefulness of the tool rather than on a particular application.

The ongoing costs of a GIS operation were not addressed in the proposal, though equipment was proposed to create new GIS capability. Consideration should be given as to how the project will be continued after the initial work has been done. It is not appropriate to purchase equipment for the project sponsor unless the project sponsor can demonstrate that it will be able to support GIS efforts in the future.

Administration:

Reviewers had no doubt that there could be significant benefit from a well-planned effort to meet the proposed objectives. Those reviewing the proposal were not convinced that the conservation district has the technical ability to lead the effort. If the proposal receives funding, monies should be contingent upon the development of a detailed scope of work and a documented budget proposal, and consideration should be given to the selection of a lead agency that has GIS capability now. Computer equipment purchased for the project should be limited to updating existing GIS equipment, if necessary.

Financial Assessment:

The budget is not well developed or justified. The funding structure is not in place to support the project. Contributions listed indicate the amount that the project sponsor anticipates receiving from other participants. These contributions have been discussed informally, but there is no evidence that matching funds are forthcoming.

Categories in the budget address all areas where costs are likely to be incurred. However, the estimates provided are not particularly appropriate. In this proposal, \$50,000.00 is requested for GIS equipment; in the proposal the project sponsor submitted to the RDG Program, \$90,000 is requested for the same equipment. In any case, the cost of a single GIS workstation should be less than \$50,000 based on the costs for similar systems purchased by the state.

The budget in the proposal should be discarded and a budget, fully developed and documented, should be negotiated if the project is funded.

Benefit Assessment:

The conservation benefits that would occur from this project are not directly related to the project but would occur if the project successfully resulted in enhanced GIS capability and if this capability was used in resource planning. There is broad support for the coordination of GIS data and for more gathering of data. Whether this project will actually result in gathering significantly more data is not known.

This project implements the policy objectives of the State Water Plan through support for watershed specific investigations that facilitate streamflow/water quality management planning.

Environmental Evaluation:

No adverse environmental impacts would occur as a result of this project.

Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be available after DNRC approves a scope of work, project administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

*******The Following Projects Are Not Recommended for Funding*******

Project No. 49

Applicant Name: City of Culbertson
Project Name: Wastewater Collection and Treatment Project

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 313,259 TSEP Grant
\$ 162,709 SRF Loan
\$ 50,550 Sponsor Sewer Fund

Estimated Total Project Cost: \$ 626,518

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

The merits of the City of Culbertson's Wastewater Collection and Treatment Project support the purpose of the Renewable Resource Grant and Loan Program by providing a safe sanitary wastewater system for the environment, residents, and employees of Culbertson. Safety and sanitary concerns have been the driving force behind the proposed project. In 1991 and 1993, a pipe service company cleaned, televised, and reported on the following problems and the potential health and safety hazards of the wastewater system:

- (1) Manholes are rusted through.
- (2) Manhole inverts do not allow proper sewage flow.
- (3) Infiltration with the collection system.
- (4) Cracks and holes within the sewer piping, a possibility of street cave-ins.
- (5) Improper lift station operation.
- (6) Lift station check valves are buried in the ground.
- (7) Sludge build-up within the lagoon treatment system (1 ½ to 3 feet).
- (8) Dike erosion, cattail growth, and muskrat burrows.
- (9) Lack of lagoon system transfer piping.

It is the intent of the proposed project to address three key elements of the Renewable Resource Grant and Loan Program. To protect, manage, and develop the City of Culbertson's wastewater and treatment facility and Montana's renewable resources, the following objectives need to be implemented:

Objectives

Rebuild banks
Remove large cattails
Replace cracked and broken wastewater lines
Reconstruct manhole

Expected Results

Prevent leaks into the Missouri River
Deter erosion and muskrat infiltration
Prevent groundwater contamination
Maintain safe, effective, efficient system

The City of Culbertson is dedicated to ensure the public safety and health of its wastewater and treatment system and Montana renewable resources, but outside financial assistance is needed.

Technical Assessment:

Background:

Culbertson collects wastewater from its 383 residential and commercial users with a central collection system that drains by gravity to a lift station. The lift station pumps the wastewater to a treatment facility which consists of three 10-acre-total retention lagoons. A recent engineering analysis noted deficiencies with the lagoons including dike erosion, piping problems, sludge accumulation, and a large growth of cattails. In addition, the lift station experiences continual clogging problems.

Approach:

The sponsor revised the proposed improvement project after submitting the application to DNRC. The revised project consists of the lift station renovation and treatment facility improvements including sludge removal, erosion control, minimal piping, fencing, seeding, and graveling. The project has been scaled back from \$1,274,534 to \$626,518.

Technical documentation was sound relative to the existing deficiencies. Reasonable alternatives were considered, and cost-effective solutions were identified to correct erosion, piping, and lift station problems. However, analysis and solutions were not presented regarding infiltration into the collection system and the unpermitted discharges that currently occur at the treatment facility. DEQ has indicated that the town will be asked to address the latter issue in the near future. The total retention treatment facility is obviously undersized as evidenced by the periodic discharges. The issues of infiltration and discharge must be addressed prior to spending money on a facility that may be abandoned or require other major improvements in the near future.

Administration:

The town will be required to complete a detailed wastewater facility plan in accordance with DEQ guidelines prior to securing an SRF loan. This process should force the unaddressed issues to be explored more thoroughly. A revised project cost estimate and schedule should be done at that time.

Financial Assessment:

After submitting the DNRC application, the project sponsor found out it was not eligible for an RD grant. The project was then scaled back. The revised budget includes a \$626,518 project utilizing a \$100,000 DNRC grant, a \$313,259 TSEP grant (1996 application has been made), a \$162,709 SRF loan (application not yet made), and \$50,550 from local wastewater reserves. The project budget includes \$24,118 for administration, \$59,450 for engineering and legal, \$2500 for facility planning, \$494,050 (\$90,000 DNRC) for construction, and \$46,400 (\$10,000 DNRC) in contingencies.

The project sponsor did not submit a revised application to DNRC. Preceding information was obtained from the sponsor's application to TSEP. The project sponsor stated in the original application that the current average monthly user rate is \$6.23, and the town does not intend to raise that rate. The sponsor stated that it could contribute \$50,550 from reserves and could incur \$100,000 in debt while maintaining the same rate structure. Because an amended application was not received by the project sponsor, the financial feasibility of the project is unclear at this time.

Benefit Assessment:

The project has potential beneficial impacts in regards to providing a reliable wastewater system for the town and improved public health and safety conditions for the community. Contamination of local groundwater resources would be reduced and the Missouri River may benefit as a result. The entire community would benefit from an improved wastewater system.

This project implements the policy objectives of the State Water Plan through support of improved water quality management. The proposal would prevent groundwater from infiltrating the sewer system, which will conserve water resources.

Environmental Evaluation:

Long-term adverse impacts are not anticipated as a result of this project. Some short-term disturbances such as noise, dust, and vegetation disruption will likely occur during the construction period but should not present a problem.

Recommendation:

Funding is not recommended for the proposed improvements at this time. It appears that the application may be premature. Additional analyses regarding collection system infiltration and unauthorized treatment facility discharges should be conducted prior to implementing the proposed improvements. It is very likely that significant changes to the proposed improvement project will result following further analysis.

Project No. 50

Applicant Name: Eastern Agricultural Research Center
Project Name: Alternative Irrigation Systems and Alternative High Value Crops for Economic Development of Our Water Resources

Amount Requested:	\$ 60,000	Grant
Other Funding Sources:	\$ 93,600	Project Sponsor
	\$ 30,000	MT Dept. of Agriculture
	\$ 15,000	Williston Area Economic Foundation
	\$ 5,000	North Dakota Ag. Product Util. Comm.
	\$ 10,000	McKenzie Co. Economic Development
	\$ 10,000	Valmont Industries
	\$ 20,000	Agri Industries

Estimated Total Project Cost: \$ 243,600

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

A lot of regional interest has been generated in eastern Montana (and western North Dakota) for agricultural

diversification and value-added food processing through irrigation development of our water and land resources in the MonDak region. The experiment station (Eastern Agricultural Research Center) at Sidney has been asked to direct new irrigated research efforts with high value crops under mechanical sprinkler irrigation systems. This project will develop an alternative irrigation system to gravity flood irrigation to permit the introduction, production, and value-added processing of high value crops on thousands of acres of irrigable land in the MonDak region. The major thrust of area conservation districts and economic development groups to date has been to secure and provide grants to purchase a linear sprinkler irrigation system to demonstrate its water conservation potential. This system would irrigate more acres with less water and help alleviate environmental concerns of irrigated agriculture. This grant project will test and evaluate high value irrigated crops under mechanized sprinkler irrigation in comparison with conventional gravity furrow flood irrigation. The crop performance and quality of the high value crops and the irrigation efficiencies of the sprinkler irrigation system will be determined and compared to conventional gravity flood irrigation to assess the potential of this alternative irrigation system and potential of high value crops in our agri-economic environment. The project will promote the improvement of irrigation and fertilization technologies and promote high value crop production, processing, and marketing as part of a region-wide effort of growers, economic development groups, agri-businesses, brokers, and processors to develop our water and land resources.

Technical Assessment:

Background:

The Eastern Agricultural Research Center (EARC) is located approximately 1 mile north of Sidney. Irrigation research has been conducted at EARC since 1949 using gravity flood irrigation methods primarily on sugar beets and spring wheat. Non-point source pollution by nitrates has been studied under flood irrigation at EARC since 1989. The proposal indicates a group of producers, businessmen, and economic development leaders have requested EARC to evaluate high-value crops under sprinkler irrigation in the MonDak area.

Approach:

The proposed project involves installation of a high-efficiency, linear sprinkler system with a computer control base station at EARC. High-value crops such as carrots, sugar beets, cabbage, potatoes, and other varieties will be grown on a 30-acre plot irrigated by the sprinkler system adjacent to the same crops irrigated with the existing flood system. A comparison of high-value crop performance, irrigation efficiencies, and nitrate levels in groundwater under each irrigation system will be conducted. An automated weather station next to the fields will be used to assist in irrigation scheduling for each crop. Crop evaluation will include crop production systems, irrigation needs, crop nutrition, pest problems, pest control, market quality, yield, crop value, and other appropriate agronomic considerations.

Administration:

Seasonal and full-time EARC personnel will perform the project tasks, including planting and care of the crops from planting through harvest and the data collection period. Specific duties will be weighing and packaging seed, planting, collecting weather and other field data, applying irrigation treatments, maintaining and harvesting plots, thinning and weeding plots, processing samples, assessing market quality, processing data, and preparing reports. Dissemination of project results will be through field tours, group meeting and published reports and information through the Montana Cooperative Extension Service.

The project will be implemented over approximately a two-year time period.

Financial Assessment:

The proposed project's total cost is \$243,600. EARC's \$60,000 grant request includes \$50,000 for professional/technical costs and \$10,000 for indirect costs. All other cost contributions in the budget are included under the project sponsor heading, which indicates contributions of \$3,000 for administration costs, \$150,000 for professional/technical costs, and \$30,600 for indirect costs.

Benefit Assessment:

The proposed project could result in some conservation of water if the growth of alternative crops is found feasible under sprinkler irrigation as opposed to flood irrigation and if existing flood irrigation is converted to sprinkler. However, the benefits of this project are primarily economic. The project is unlikely to result in significant conservation, preservation, or development of renewable resources. The irrigation efficiency issues presented by sprinkler versus flood irrigation have been studied extensively, and it is unlikely that this project would contribute new information.

The proposed project will implement the State Water Plan sections regarding water-use efficiency through improvement of the efficiency of irrigation systems.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of this project. Temporary disturbances of soil and vegetation will occur during installation of the irrigation system and power lines to the pump site. Without the proper precautions, there is potential for groundwater contamination by fertilizers and chemicals applied to the cropland in the study area.

Recommendation:

DNRC recommends that this project receive no funding. The proposed project, as described, appears to be primarily an economic development project. The comparison of sprinkler versus flood irrigation efficiency and the comparison of nitrate leaching under the two types of systems is already well documented, thus would provide little benefit. No renewable resource problem or management concern is described that has not already been studied and well documented.

Project No. 51

Applicant Name: Richland County
Project Name: Lone Tree Creek Channel Rehabilitation

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 98,750 Richland County
\$ 200,000 MDOT Application
\$ 398,750 TSEP Application

Estimated Total Project Cost: \$ 797,500

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

The Lone Tree Creek Channel Rehabilitation Project addresses the minimum defined flow channel of Lone Tree Creek, which runs through the County of Richland including the City of Sidney. The project's intent is to study, design, and construct modifications to the flow channel of Lone Tree Creek from the discharge of the Vaux Dams to the Yellowstone River floodplain. With the advent of the study, the following will be accomplished:

- (1) Determination of areas that need modifications
- (2) Cost/Benefit Ratio
- (3) Utilization of existing land use
- (4) Construction/Rehabilitation of modifications
 - Channel Widening
 - Clearing
 - Grubbing and/or Grading

To ensure adequate flow carrying capacity of Lone Tree Creek, the County of Richland is also in the process of submitting an application to the Treasure State Endowment Fund and designating Montana Department of Transportation (DOT) Urban funds to replace two bridges. The cost of the two structures and the channel modification is estimated at \$797,500.00.

The existing channel of Lone Tree Creek is hampered by dense stands of trees and brush measuring 3 to 6 inches. Lone Tree Creek is fed by an 84-square-mile drainage basin and is impounded by several dams constructed in its route (In 1995, the largest dam located upstream from Sidney was modified in accordance to dam safety rules.) Lone Tree Creek is experiencing frequent and longer discharges in its downstream reaches. These discharges encounter trees and debris found in the channel creating back-up.

The back-up caused by obstructions of the natural flow increases the risk and severity of flooding to residential homes and to the following facilities:

Sidney/Richland Airport, Richland County Shop, Sidney Country Club, Richland County Fairgrounds, Lower Yellowstone Main Canal, Westside Elementary School, Richland County Housing Authority, Community Memorial Hospital, strip mall (five stores), fast-food restaurant, gas station, and the motel.

Technical Assessment:

Background:

According to the applicant, increased storm water flooding in Sidney is a problem that began in 1995. The applicant states this flooding is a result of changes to the Vaux dams on Lone Tree Creek upstream from Sidney. One dam was removed and the other dam modified. The remaining dam now holds less than 50 acre-feet of water. The applicant states that these changes will result in a substantial increase in the frequency and duration of flow through town. Apparently, this suspected increase in streamflow has generated concerns over localized flooding jeopardizing Sidney's and Richland counties' infrastructures. The applicant anticipates that increases in flows will causes trees and shrubs to die next to Lone Tree Creek. If a snag falls into the stream and wedge in the channel, a collection of debris forms behind the blockage, and waters flood adjacent lands.

Approach:

The applicant has proposed a channelization project on Lone Tree Creek. This project was prompted in an effort to manage flood flows through Sidney.

There are no supporting data to backup the claim that the changes to the dams will substantially increase flood frequency and duration. The dam changes will have some effect on the 5-year and 10-year floods. The 5-year and 10-year floods are minor floods that occur more frequently with lower water elevations and lower velocities, as compared to the larger more destructive 100-year and 500-year floods. The applicant did not provide any data as to what the changes to the 5-year and 10-year flood elevations and velocities would be as a result of dam removal and modification.

Lone Tree Creek will continue to flood, but the proposed stream channelization is not the answer. The 100-year flood on Lone Tree Creek has a flow of 4,050 cfs with high flow velocities. This is a large amount of water to attempt to restrict and manage in this area. These type of velocities are very damaging on the type of soils found in the Lone Tree floodplain. A channelization of the flows will only increase the damage potential. This magnitude of flow requires significant floodplain to release its energy thereby reducing damage during a 100-year flood event.

Past experience, across the nation, has shown that it is better to manage people and development as opposed to managing the flood itself. If additional flood control is proven necessary after nonstructural alternatives are implemented, detention basins for off-stream storage of high flows work well in urbanized areas. This method has been proven effective without damaging the stream channel.

Administration:

Richland County will administer the project. A qualified engineering consultant will be employed to conduct the necessary study, design, and construction of the project.

Financial Assessment:

The total cost for the project is estimated at \$797,500. The grant amount requested is \$100,000. Richland County has obligated \$98,750 for this project. The county has applied for \$398,000 from TSEP and \$200,000 from MDOT to replace two bridges.

The grant funding request would provide \$70,600 for the construction contract, \$23,900 for engineering hydrologic analysis, and \$5,500 for project administration. The \$98,750 in match funding from Richland County are the only match funds that have been committed at this time. The county funds are for assistance with channel grading, vegetation removal, and grubbing.

Benefit Assessment:

The increased flood risk claimed by the applicant is not substantiated by the documentation. It is not apparent if there is a concern over public health and safety from flooding or purely a concern over damage to public and private property. There is not specific information as to the exact number of structures affected. The public facilities named by the applicant as being at risk from flooding--the hospital, airport, Westside Elementary School, fairgrounds, and county shop--are outside the 100-year and 500-year floodplain.

The chosen alternative of channel straightening and widening, stream bed and bank grubbing and grading, and riparian vegetation removal may very well prove to exacerbate flood problems in the long run. In other areas where streams have

been straightened and widened in the past, funds are now being spent to put back meanders and replant vegetation as a means to slow flood waters.

Environmental Evaluation:

The proposed project alternative presents both short- and long-term negative environmental impacts. Apparently, the applicant intends to remove all vegetation from the stream bed and banks and does not indicate any plans to revegetate the stream bank once the channel has been widened. In the past, this has proven to have disastrous consequences. Removing all vegetation creates an unstable stream bed and stream bank, which will only exacerbate flood problems.

The applicants environmental evaluation concludes that no identified wetlands will be affected. There is no further detail given as to how this conclusion was made. It is likely that this floodplain does contain some wetland areas that could be detrimentally affected.

Recommendation:

The applicant has not adequately documented the anticipated increased level of flood risk to the city/county. The project as presented will have an overall long-term negative impact to the environment. Also, the applicant has not given consideration to other project alternatives that could prove to be more cost effective and have less impact on the environment. No funding is recommended.

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